Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547203	EPA MRID Number: 47127918

Data Requirement:	PMRA Data Code:	9.8.4 (TGAI) or 9.8.6 (EP)
	EPA DP Barcode:	DP349851
	OECD Data Point:	IIA 8.12 (TGAI) and IIIA 10.8.1.1 (EP)
	EPA Guideline:	OPPTS 850.4225 (123-1a)

Test material: BAS 800 02 H   **Purity:** 12.0% (wt/wt)

Common name: Saflufenacil

Chemical name: IUPAC: N'-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide

CAS name: Not Reported

CAS No.: 372137-35-4

Synonyms: None Reported

Primary Reviewer: John Marton	**Signature:**
Staff Scientist, Cambridge Environmental, Inc.	**Date:** 04/01/08
Secondary Reviewer: Teri S. Myers	**Signature:**
Senior Scientist, Cambridge Environmental, Inc.	**Date:** 04/14/08
Primary Reviewer: Anita Pease	**Date:** 06/09/09
Senior Biologist, U.S. EPA	
Secondary Reviewer: Janine Glaser	**Date:** 06/09/09
HC-PMRA-EAD	
Secondary Reviewer: Farzad Jahromi	**Date:** 06/09/09
DEWHA-APVMA	

Company Code	BAZ
Active Code	SFF
Use Site Category:	13 (terrestrial feed crops) and 14 (terrestrial food crops)
EPA PC Code	118203

CITATION: Porch, J.R., H.O. Krueger, K. Martin and C. Holmes. 2007. BAS 800 02 H: A Toxicity Test to Determine the Effects of the Test Substance on Seedling Emergence of Ten Species of Plants. Unpublished study performed by Wildlife International, Ltd., Easton, MD. Laboratory report number 147-228. Study sponsored by BASF Corporation, Research Triangle Park, NC. Study completed November 9, 2007.

DISCLAIMER: This document provides guidance for EPA and PMRA reviewers on how to complete a data evaluation record after reviewing a scientific study concerning the acute toxicity of a pesticide to terrestrial vascular plants. It is not intended to prescribe conditions to any external party for conducting this study nor to establish absolute criteria regarding the assessment of whether the study is scientifically sound and whether the study satisfies any applicable data requirements. Reviewers are expected to review and to determine for each study, on a case-by-case basis, whether it is scientifically sound and provides sufficient information to satisfy applicable data requirements. Studies that fail to meet any of the conditions may be accepted, if appropriate; similarly, studies that meet all of the conditions may be rejected, if appropriate. In sum, the reviewer is to take into account the totality of factors related to the test methodology and results in determining the acceptability of the study.

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PMRA Submission Number: 2008-0431
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EXECUTIVE SUMMARY:

The effect of BAS 800 02 H (formulation containing the active ingredient Saflufenacil) on the seedling emergence of monocot (corn, *Zea mays*; onion, *Allium cepa*; ryegrass, *Lolium perenne*; and wheat, *Triticum aestivum*) and dicot (bean, *Phaseolus vulgaris*; cabbage, *Brassica oleracea*; lettuce, *Lactuca sativa*; oilseed rape, *Brassica napus*; soybean, *Glycine max*; and tomato, *Lycopersicon esculentum*) crops was studied at varying nominal application rates. Cabbage and lettuce were treated with nominal application rates of 0 (negative and adjuvant controls), 0.00049, 0.0015, 0.0044, 0.0132, 0.0396 and 0.119 lbs a.i./A (equivalent to 0 (controls), 0.549, 1.65, 4.94, 14.8, 44.4, and 133 g a.i./ha, respectively); measured application rates were 0.000629, 0.00143, 0.00392, 0.0127, 0.0321 and 0.112 lbs a.i./A (equivalent to 0.704, 1.60, 4.39, 14.2, 35.9, and 125 g a.i./ha, respectively). Onion was treated with nominal application rates of 0 (negative and adjuvant controls), 0.0015, 0.0044, 0.0132, 0.0396, 0.119 and 0.357 lbs a.i./A (equivalent to 0 (controls), 1.65, 4.94, 14.8, 44.4, 133, and 400 g a.i./ha, respectively); measured application rates were 0.00143, 0.00392, 0.0127, 0.0321, 0.112 and 0.347 lbs a.i./A (equivalent to 1.60, 4.39, 14.2, 35.9, 125, and 389 g a.i./ha, respectively). Oilseed rape and tomato were treated with nominal application rates of 0 (negative and adjuvant controls), 0.0015, 0.0044, 0.0132, 0.0396 and 0.119 lbs a.i./A (equivalent to 0 (controls), 1.65, 4.94, 14.8, 44.4, and 133 g a.i./ha, respectively); measured application rates were 0.00143, 0.00392, 0.0127, 0.0321 and 0.112 lbs a.i./A (equivalent to 1.60, 4.39, 14.2, 35.9, and 125 g a.i/ha, respectively). Corn, ryegrass, wheat, bean and soybean were treated with nominal application rates of 0 (negative and adjuvant controls), 0.0044, 0.0132, 0.0396, 0.119 and 0.357 lbs a.i./A (equivalent to 0 (controls), 4.94, 14.8, 44.4, 133, and 400 g a.i./ha, respectively); measured application rates were 0.00483, 0.0127, 0.0376, 0.111 and 0.319 lbs a.i./A (5.41, 14.2, 42.1, 124, and 357 g a.i./ha, respectively). The growth medium used in the seedling emergence test was natural soil, classified as a sandy loam, with an organic matter content of 1.3% and a pH of 7.2. On Day 21 the surviving plants per pot were recorded and cut at soil level for measuring the plant height and dry weight.

Dry weight was significantly affected in all species with the exception of corn and onion; plant height was significantly affected in all species with the exception of corn, onion, wheat and bean; and survival was significantly affected in all species with the exception of corn and wheat. The % inhibition in seedling emergence in the treated species as compared to the control ranged from -18.8% (ryegrass) to 96.6% (lettuce). The most sensitive monocot species, based on dry weight, in the seedling emergence test was ryegrass with NOAEC, EC_{05} EC_{25}, and EC_{50} values of 0.0127, 0.0012, 0.0062, and 0.0198 lbs a.i./A, respectively (equivalent to 14.2, 1.32, 6.97, and 22.2 g a.i./ha, respectively) Oilseed rape was the most sensitive dicot, based on % survival, with NOAEC, EC_{05}, EC_{25} and EC_{50} values of <0.00143, 0.0002, 0.00087, and 0.0026 lbs a.i./A, respectively (equivalent to <1.6, 0.2241, 1.05, and 2.91 g a.i./ha, respectively).

Phytotoxic effects were observed in all species with the exception of wheat. Observed effects included chlorosis, necrosis, stem curl, leaf curl, color change and unshed seed coats.

Maximum Labeled Rate: Not Reported

Results Synopsis

Monocot

EC_{05}/IC_{05}: 0.0012 lbs a.i./A (1.32 g a.i./ha)   95% C.I.: 5.4×10^{-6}-0.0236 lbs a.i./A (0.006-26.4 g a.i./ha)
EC_{25}/IC_{25}: 0.0062 lbs a.i./A (6.97 g a.i./ha)   95% C.I.: <0.0000-0.0468 lbs a.i./A (<0.0000-49.0 g a.i./ha)
EC_{50}/IC_{50}: 0.0198 lbs a.i./A (22.2 g a.i./ha)   95% C.I.: N.D
NOAEC: 0.0127 lbs a.i./A (14.2 g a.i./ha)
Slope: N.D.
Std err: N.D.
Most sensitive monocot: Ryegrass

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

Most sensitive parameter: Dry Weight

Dicot
EC_{05}/IC_{05}: 0.0002 lbs a.i./A (0.2241 g a.i./ha)   95% C.I.: 1.4×10^{-5}-0.0021 lbs a.i./A (0.0157-2.35 g a.i./ha)
EC_{25}/IC_{25}: 0.00087 lbs a.i./A (1.05 g a.i./ha)   95% C.I.: 0.00016-0.0048 lbs a.i./A (0.1792-5.38 g a.i./ha)
EC_{50}/IC_{50}: 0.0026 lbs a.i./A (2.91 g a.i./ha)   95% C.I.: 0.00078-0.0088 lbs a.i./A (0.8738-9.86 g a.i./ha)
NOAEC: <0.00143 lbs a.i./A (<1.6 g a.i./ha)
Slope: 1.40
Std err: 0.366
Most sensitive dicot: Oilseed Rape
Most sensitive parameter: Percent Survival

This toxicity study is classified as **ACCEPTABLE to U.S. EPA, FULLY RELIABLE to PMRA, and as FULLY RELIABLE WITH RESTRICTION to APVMA**. The study is classified as FULLY RELIABLE WITH RESTRICTION to APVMA because critical toxicity values could not be determined for the most sensitive dicot oilseed rape survivial endpoint.

Table 1. Summary of most sensitive parameters by species (lbs a.i./A and g a.i./ha).

Species	Endpoint	NOAEC	EC_{05}	EC_{25}	EC_{50}
Corn	None	0.319 / 357	>0.319 / >357	>0.319 / >357	>0.319 / >357
Onion	Dry Weight	0.347 / 389	0.0056 / 6.23	0.0121 / 13.6	>0.347 / >389
Ryegrass	Dry Weight	0.0127 / 14.2	0.0012 / 1.32	0.0062 / 6.97	0.0198 / 22.2
Wheat	Dry Weight	0.111 / 124	0.0020 / 2.2	0.1189 / 133	>0.319 / >357
Bean	Percent Survival	0.0127 / 14.2	0.0033 / 3.70	0.12 / 134	>0.319 / >357
Cabbage	Percent Survival	0.000629 / 0.704	0.0001 / 0.1568	0.00097 / 1.09	0.0038 / 4.26
Lettuce	Dry Weight	0.00392 / 4.39	0.0002 / 0.2456	0.00087 / 1.05	0.0052 / 5.82
Oilseed Rape	Percent Survival	<0.00143 / <1.6	0.0002 / 0.2241	0.00087 / 1.05	0.0026 / 2.91
Soybean	Dry Weight	0.111 / 124	0.0020 / 2.23	0.2069 / 232	>0.319 / >357
Tomato	Dry Weight	0.00413 / 1.6	0.0004 / 0.4712	0.0019 / 2.12	0.0033 / 3.72

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: This study was conducted following guidelines outlined in the U.S. Environmental Protection Agency Series 850- Ecological Effects Test Guidelines (draft) OPPTS Number 850.4100 and 850.4225. The following deviations from OPPTS 850.4225 were noted:

1. The geographic location, depth of collection, CEC and moisture content of the test soil were not specified.
2. Due to an error, only three replicates were prepared for the lettuce negative control.
3. Due to significant inhibitions at all treatment levels relative to the negative control, the reviewer was unable to determine NOAEC, EC_{05} and EC_{25} values for oilseed rape survival.
4. The reviewer detected a significant difference between the two controls for wheat plant height, with the mean height of the plants in the adjuvant control 5.9% greater than the mean height in the negative control. Similarly, a significant difference was detected between the controls for lettuce plant height with mean height of the adjuvant control plants 27.6% greater than the mean height of the negative control plants. A significant difference was detected between the two controls for corn and tomato dry weight, with the mean weight 8.7 and 12.3% less in the adjuvant control relative to the negative

control. A significant difference was detected between the controls for tomato plant height with the mean plant height in the negative control 15.1% greater than the mean plant height in the adjuvant control.

The deviation associated with the inability to determine a critical toxicity NOAEC value for oilseed rape, the most sensitive dicot species, impact the acceptability of the study for APVMA. It should be noted, however, that U.S. EPA classifies the study as "acceptable" because an EC05 value was derived for the oilseed rape survival endpoint.

COMPLIANCE: Signed and dated No Data Confidentiality, GLP and Quality Assurance statements were provided. This study was conducted in compliance with Good Laboratory Practice Standards as published by the U.S. Environmental Protection Agency in 40 CFR Part 160, 17 August 1989; OECD Principles of Good Laboratory Practice (ENV/MC/CHEM (98) 17); and Japan MAFF, 11 NohSan, Notification No. 6283, Agricultural Production Bureau, October 1, 1999, with the following exception: periodic analyses of water and soil for potential contaminants were performed using a certified laboratory and standard U.S. EPA analytical methods.

A. MATERIALS:

1. Test Material   BAS 800 02 H (formulation containing Saflufenacil)

Description: A Liquid

Lot No./Batch No. :   1613-91 (Batch Number)

Purity: 12.0% (wt/wt)

Stability of compound
under test conditions: Analytical recoveries of the spray solutions ranged from 81-128% of nominal.*(OECD recommends chemical stability in water and light)*

Storage conditions of
test chemicals: Stored at ambient conditions without exposure to sunlight.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

Table 2. Physical/chemical properties of BAS 800 02 H.

Parameter	Values	Comments
Water solubility at 20°C	Not Reported	
Vapor pressure	Not Reported	
UV absorption	Not Reported	
pKa	Not Reported	
Kow	Not Reported	

2. Test organism:

Monocotyledonous species: Corn (*Zea mays*, Family Poaceae, Mandan Bride), Onion (*Allium cepa*, Family Liliaceae, WI 301), Ryegrass (*Lolium perenne*, Family Poaceae, Manhattan 4) and Wheat (*Triticum aestivum*, Family Poaceae, Polk).; *EPA recommends four monocots in two families, including corn.*

Dicotyledonous species: Bean (*Phaseolus vulgaris*, Family Fabaceae, Red Kidney), Cabbage (*Brassica oleracea*, Family Brassicaceae, Late Flat Dutch), Lettuce (*Lactuca sativa*, Family Asteraceae, Buttercrunch), Oilseed Rape (*Brassica napus*, Family Brassicaceas, Dwarf Essex), Soybean (*Glycine max*, Family Fabaceae, Williams 82) and Tomato (*Lycopersicon esculentum*, Family Solanaceae, Rutgers); *EPA recommends six dicots in four families, including soybean and a root crop.*

OECD recommends a minimum of three species selected for testing, at least one from each of the following categories: Category 1: ryegrass, rice, oat, wheat, and sorghum; Category 2: mustard, rape, radish, turnip, and Chinese cabbage; Category 3: vetch, mung bean, red clover, fenugreek, lettuce, and cress.

Seed source: Corn, wheat and lettuce seeds were obtained from Johnny's Selected Seeds, Winslow, ME. Onion seeds were obtained from Wannamaker Seeds, St. Matthews, SC. Ryegrass, bean, cabbage and tomato seeds were obtained from Meyer Seed Co., Baltimore, MD. Oilseed rape seeds were obtained from Seedland Inc., Wellborn, FL. Soybean seeds were obtained from Missouri Foundation Seeds, Columbia, MO.
Prior seed treatment/sterilization: None reported
Historical % germination of seed: 85-94%
Seed storage, if any: No storage was reported

B. STUDY DESIGN:

1. Experimental Conditions

   a. Limit test: N/A- test was conducted under Tier II conditions.

   b. Range-finding study: No range-finding data were provided.

   c. Definitive Study

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

Table 3: Experimental Parameters - Seedling Emergence.

Parameters	Seedling Emergence	
	Details	Remarks
		Criteria
Duration of the test	21 Days	*Recommended test duration is 14-21 days.* *OECD recommends that the test be terminated no sooner than 14 days after 50 percent of the control seedlings have emerged*
Number of seeds/plants/species/replicate	10 seeds per replicate	*Ten seeds per replicate should be used.* *OECD recommends a minimum of five seeds planted in each replicate within 24 hours of incorporation of the test substance. All seeds of each species for each test should be of the same size class. The seed should not be imbibed.*
Number of replicates Control: Adjuvant control: Treated:	 4 4 4/level	Due to an error, only three replicates were prepared for the lettuce negative control. --- *Four replicates per dose should be used.* *OECD recommends a minimum of four replicates per treatment*

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

Parameters	Seedling Emergence	
	Details	**Remarks**
		Criteria
Test concentrations (lb ai/A or g ai/ha) Nominal:	Corn, Ryegrass, Wheat, Bean and Soybean: 0 (negative and adjuvant controls), 0.0044, 0.0132, 0.0396, 0.119 and 0.357 lbs a.i./A (0 (controls), 4.94, 14.8, 44.4, 133, and 400 g a.i./ha)	*Five test concentrations should be used with a dose range of 2X or 3X progression* *OECD recommends three concentrations, preferably with application rates equivalent to 0.0 (control), 1.0, 10.0 and 100 mg substance per kg of oven-dried soil.*
Measured:	<LOQ (controls), 0.00483, 0.0127, 0.0376, 0.111 and 0.319 lbs a.i./A (<LOQ (controls), 5.41, 14.2, 42.1, 124, and 357 g a.i./ha)	
Nominal:	Cabbage and Lettuce: 0 (negative and adjuvant controls), 0.00049, 0.0015, 0.0044, 0.0132, 0.0396 and 0.119 lbs a.i./A (0 (controls), 0.549, 1.65, 4.94, 14.8, 44.4, and 133 g a.i./ha)	
Measured:	<LOQ (controls), 0.000629, 0.00143, 0.00392, 0.0127, 0.0321 and 0.112 lbs a.i./A (<LOQ (controls), 0.704, 1.60, 4.39, 14.2, 35.9, and 125 g a.i./ha)	
Nominal:	Onion: 0 (negative and adjuvant controls), 0.0015, 0.0044, 0.0132, 0.0396, 0.119 and 0.357 lbs a.i./A (0 (controls), 1.65, 4.94, 14.8, 44.4, 133, and 400 g a.i./ha)	
Measured:	<LOQ (controls), 0.00143, 0.00392, 0.0127, 0.0321, 0.112 and 0.347 lbs a.i./A (<LOQ (controls), 1.60, 4.39, 14.2, 35.9, 125, and 389 g a.i./ha)	
Nominal:	Oilseed Rape and Tomato: 0 (negative and adjuvant controls), 0.0015, 0.0044, 0.0132, 0.0396 and 0.119 lbs a.i./A (0 (controls),	

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

Parameters	Seedling Emergence	
	Details	**Remarks**
		Criteria
Measured:	1.65, 4.94, 14.8, 44.4, and 133 g a.i./ha) <LOQ (controls), 0.00143, 0.00392, 0.0127, 0.0321 and 0.112 lbs a.i./A (<LOQ (controls), 1.60, 4.39, 14.2, 35.9, and 125 g a.i./ha)	
Method and interval of analytical verification LOQ: LOD:	Samples were collected prior to application and analyzed using HPLC equipped with a Waters 486 variable wavelength detector. 1.20 µg a.i./mL 0.400 µg a.i./mL	
Adjuvant (type, percentage, if used)	Two components were used to prepare the adjuvant. First was ammonium sulfate (purity of 99.6%) and the second was Scoil Spray Adjuvant, containing methylated seed soil. The adjuvant spray mixture was prepared by diluting 40 g of ammonium sulfate and 20 mL of Scoil spray adjuvant to 2000 mL with osmosis-purified water. On June 28 and 29, 8.3319 g and 8.3331 of the test substance, respectively, were diluted to 500 mL with adjuvant control to prepare the highest nominal application rate (0.357 lbs a.i./A). The remaining treatment levels were prepared by proportionally diluting the stock solution.	
Test container (pot)		

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

Parameters	Seedling Emergence		
	Details	**Remarks**	
		Criteria	
Size/Volume Material: (glass/polystyrene)	16 cm in diameter by 12 cm deep Plastic	*Non-porous containers should be used.* *OECD recommends that non-porous plastic or glazed pot be used.*	
Growth facility	On-site greenhouse		
Method/depth of seeding	Corn, wheat, bean and soybean were planted to an approximate depth of 20 mm; the remaining species were planted at approximately 6 mm.		
Test material application Application time including the plant growth stage Number of application Application interval Method of application	Test material was applied to the soil surface on Day 0. Single application N/A DeVries Research Track Sprayer		
Details of soil used Geographic location Depth of soil collection Soil texture % sand % silt % clay pH: % organic carbon CEC Moisture at 1/3 atm (%)	Not Reported Not Reported Sandy Loam 75% 11% 14% 7.2 1.3% (organic matter content) Not Reported Not Reported	*Soil mixes containing sandy loam, loam, or clay loam soil with no greater than 2% organic matter are preferable. Glass beads, rock wool, and 100% acid washed sand are not preferred.* *OECD prefers the soil to be sieved (0.5 cm) to remove coarse fragments. Carbon content should not exceed 1.5% (3% organic matter). Fine particles (under 20um) makeup should be between 10 and 20%. The recommended pH is between 5.0 and 7.5.*	

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

Parameters	Seedling Emergence	
	Details	**Remarks**
		Criteria
Details of nutrient medium, if used	N/A; a nutrient medium was not used	
Watering regime and schedules Water source/type: Volume applied: Interval of application: Method of application:	Well water As needed As needed Sub-irrigation	*EPA prefers that bottom watering be utilized for seedling emergence studies so that the chemical is not leached out of the soil during the test.*
Any pest control method/fertilization, if used	A slow-release fertilized was added to provide nutrients essential for plant growth.	
Test conditions Temperature: Photoperiod: Light intensity and quality: Relative humidity: Temperature: Photoperiod: Light intensity and quality: Relative humidity:	Corn, Ryegrass, Wheat, Bean and Soybean: 19.93-42.74°C 16L:8D 12.7-14.8 moles PAR 23.73-92.20% Onion, Cabbage, Lettuce, Oilseed Rape and Tomato: 19.93-36.24°C 16L:8D 12.7-14.8 moles PAR 23.73-92.20%	*EPA prefers that the cold vs warm loving plants be tested in two separate groups to optimize plant growth.* *OECD prefers that the temperature, humidity and light conditions be suitable for maintaining normal growth of each species for the test period.*
Reference chemical (if used) Name: Concentrations:	N/A N/A	A reference chemical was not used.
Other parameters, if any	None	

2. Observations:

Table 4: Observation Parameters - Seedling Emergence.

Parameters	Seedling Emergence	
	Details	**Remarks**

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

Parameters measured (e.g., number of germinated seeds, emerged seedlings, plant height, dry weight or other endpoints)	-Emergence -Survival -Plant Height -Dry Weight -Phytotoxicity	
Measurement technique for each parameter	Emergence, survival and phytotoxicity were determined by visual assessment. Seedling height was measured with a ruler to the nearest whole centimeter from the surface of the soil to the apical meristem (tomato, soybean, bean) or to the tip of the tallest leaf (all other species). Seedlings were then clipped at soil level, the shoots of all living seedlings within a replicate were dried and weighed as a group.	Emergence was defined as the presence of visible plant tissue at the surface of the soil.
Observation intervals	Emergence was assessed on Days 7, 14 and 21. Survival, phytotoxicity, dry weight and plant height were determined at test termination.	
Other observations, if any	None Reported	
Were raw data included?	Yes	
Phytotoxicity rating system, if used	0, no effect; 10-30 slight effect (10- barely noticeable, 20- not apparently detrimental, 30- effect more pronounced); 40-60, moderate effect (40- moderate, recovery possible, 50-more lasting effect and recovery doubtful, 60- lasting effect and recovery doubtful); 70-90 severe effect (70- heavy injury w/ loss of leaves, 80- plant nearly	Rating scale adapted from: Frans, Robert E and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

	destroyed w/ few surviving leaves, 90-occasional surviving leaves); 100, complete effect	

II. RESULTS and DISCUSSION:

A. INHIBITORY EFFECTS:

1. Seedling Emergence:

The reviewer's results indicated that corn and onion were the only species not exhibiting significant inhibitions based on dry weight. Corn, onion, wheat and bean exhibited no significant inhibitions based on plant height, and corn and wheat were the only two species not exhibiting significant inhibitions based on percent survival. The reviewer's results indicated that ryegrass was the most sensitive monocot, based on dry weight, with NOAEC, EC_{05} EC_{25}, and EC_{50} values of 0.0127, 0.0012, 0.0062, and 0.0198 lbs a.i./A, respectively (equivalent to 14.2, 1.32, 6.97, and 22.2 g a.i./ha, respectively) Oilseed rape was the most sensitive dicot, based on % survival, with NOAEC, EC_{05}, EC_{25} and EC_{50} values of <0.00143, 0.0002, 0.00087, and 0.0026 lbs a.i./A, respectively (equivalent to <1.6, 0.2241, 1.05, and 2.91 g a.i./ha, respectively).

All surviving wheat seedlings appeared normal and healthy at test termination. Slight necropsy was observed in two corn seedlings. Slight chlorosis and slight to moderate necrosis were observed for onion; however, these effects were sporadic and not considered to be treatment related. Slight to severe necrosis was observed throughout the three highest ryegrass treatment levels in a dose-dependent fashion. Slight to moderate leaf curl, slight stem curl and slight necrosis were observed at the highest bean treatment level, with the majority of the effects being restricted to one replicate. An additional bean seedling at the 0.0127 lbs a.i./A treatment level exhibited severe stem curl. Slight to severe necrosis, chlororis and leaf curl were observed throughout the cabbage treatment levels with severity and frequency increasing with application rate. Slight to moderate chlorosis and necrosis were observed in the lettuce treatment levels containing live seedlings. Oilseed rape seedlings were exhibiting slight to severe necrosis and moderate to severe color change on Day 21 in all treatment levels except the highest; the one surviving seedling at the highest level appeared normal and healthy. Soybean seedlings exhibited slight to moderate leaf curl, necrosis and stem curl, but the effects did not appear in a strong dose-dependent relationship. Tomato seedlings exhibited slight to severe chlorosis, slight leaf curl, slight to severe necrosis, slight stem curl and one seedling exhibited an unshed seed coat. Plant injury was assessed using the following rating scale: 0, no effect; 10-30 slight effect (10- barely noticeable, 20- not apparently detrimental, 30- effect more pronounced); 40-60, moderate effect (40-moderate, recovery possible, 50-more lasting effect and recovery doubtful, 60- lasting effect and recovery doubtful); 70-90 severe effect (70- heavy injury w/ loss of leaves, 80- plant nearly destroyed w/ few surviving leaves, 90-occasional surviving leaves); 100, complete effect. This scale was adapted from: Frans, Robert E and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

B. REPORTED STATISTICS:

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

Mean seedling emergence, survival, dry weight and height of the control and treatment groups were compared in the test with a Dunnett's t-test, using the DUNNETT option of the GLM (general linear model) procedure of SAS version 8. The negative and adjuvant control groups were compared in order to evaluate potential effects resulting from the adjuvant. Where no such effects were noted, the control groups were pooled for comparison to the treatment levels. Significance was determined at the level of 0.05. Additionally, test data were evaluated to determine the LOAEC and NOAEC for plant height, emergence, weight and survival. Dunnett's test was used to help establish these values by determining which treatment groups differed significantly from the control group.

Statistical analyses for species also included the determination of effect rates (ER estimates) and their confidence limits using the non-linear regression analysis of Bruce and Versteeg when reductions in test endpoints among one or more treatment groups were 25% or more relative to control means. Analyses were conducted using the NLIN procedure of SAS. The data for cabbage dry weight and soybean height were not conducive to analysis by non-linear regression, therefore ERx estimates were calculated using the ICPIN linear interpolation method.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

Table 5: Reported effect of BAS 800 02 H on Seedling Emergence

Species	Results summary for dry weight (lbs a.i./A; based on nominal concentrations; reported by the study author)								
	g*	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	r^2
Corn	1.29-1.37	0.357	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Onion	0.011-0.019	0.357	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Ryegrass	0.015-0.031	0.0132	N.R.	N.R.	0.0064	0.000088-0.47	0.21	0.015-2.9	0.85717
Wheat	0.155-0.209	0.357	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Bean	1.37-1.83	0.357	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Cabbage	0.188-0.548	0.0396	N.R.	N.R.	0.076	0.014-0.078	0.11	0.020-0.12	N.R.
Lettuce	0.007-0.267[1]	0.00049	N.R.	N.R.	0.00090	0.000051-0.016	0.0019	0.00023-0.016	0.86908
Oilseed Rape	0.618-1.382	0.119	N.R.	N.R.	>0.119	N/A	>0.119	N/A	N.R.
Soybean	0.96-1.20	0.357	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Tomato	0.192-0.269	0.0132	N.R.	N.R.	>0.0132	N/A	>0.0132	N/A	N.R.

* range provided represents the range of the treatment means including controls
[1] value did not appear dose-responsive and was excluded from regression
N/A- Not Applicable
N.R.- Not Reported

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

Table 5a: Reported effect of BAS 800 02 H on Seedling Emergence

Species	Results summary for plant height (lbs a.i./A; based on nominal concentrations; reported by thet study author)								
	cm*	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	r^2
Corn	73.6-77.1	0.357	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Onion	10.0-15.2	0.357	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Ryegrass	10.2-15.9	0.0132	N.R.	N.R.	0.048	0.0051-0.45	>0.357	N/A	0.89352
Wheat	36.8-41.3	0.119	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Bean	40.0-46.7	0.357	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Cabbage	9.3-16.5	0.0396	N.R.	N.R.	0.076	0.054-0.11	>0.119	N/A	0.93342
Lettuce	2.0-11.3[1]	0.0044	N.R.	N.R.	0.0015	0.00013-0.017	0.0039	0.00080-0.019	0.93664
Oilseed Rape	13.7-25.7	0.119	N.R.	N.R.	>0.119	N/A	>0.119	N/A	N.R.
Soybean	29.0-39.4	0.119	N.R.	N.R.	0.33	0.14-0.35	>0.357	N/A	N.R.
Tomato	8.3-14.0	0.0044	N.R.	N.R.	0.0052	0.00069-0.039	>0.0132	N/A	0.89080

* range provided represents the range of the treatment means including controls
[1] value did not appear dose-responsive and was excluded from regression
N/A- Not Applicable
N.R.- Not Reported

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

Table 5b: Reported effect of BAS 800 02 H on Seedling Emergence

Species	Results summary for survival (lbs a.i./A; based on nominal concentrations; reported by the study author)								
	%*	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	r^2
Corn	100	0.357	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Onion	67.5-97.2	0.0396	N.R.	N.R.	0.022	0.0094-0.052	0.25	0.14-0.42	0.97394
Ryegrass	57.5-100	0.0396	N.R.	N.R.	0.076	0.0016-3.7	>0.357	N/A	0.67594
Wheat	96.9-100	0.357	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Bean	67.0-100	0.0132	N.R.	N.R.	0.053	0.015-0.19	>0.357	N/A	0.95768
Cabbage	9.1-100	0.00049	N.R.	N.R.	0.0012	0.00042-0.0036	0.0046	0.0022-0.010	0.96390
Lettuce	0-95.2	0.00049	N.R.	N.R.	0.00092	0.00051-0.0017	0.0018	0.0012-0.0028	0.97007
Oilseed Rape	3.6-97.5	0.0015	N.R.	N.R.	0.00088	0.00014-0.0055	0.0026	0.00073-0.0094	0.93861
Soybean	81.0-100	0.119	N.R.	N.R.	>0.357	N/A	>0.357	N/A	N.R.
Tomato	0-93.1	0.0015	N.R.	N.R.	0.0024	0.0012-0.0050	0.0047	0.0028-0.0078	0.99149

* range provided represents the range of the treatment means including controls
N/A- Not Applicable
N.R.- Not Reported

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

Table 5c: Reported effect of BAS 800 02 H on Seedling Emergence

Species	Results summary for seedling emergence at Day 21 (lbs a.i./A and g a.i./A; based on nominal concentrations; reported by the study author)[1]								
	%*	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	r^2
Corn	90.0-97.5	0.357 (400)	N.R.	N.R.	>0.357 (>400)	N.A.	>0.357 (>400)	N.A.	N.R
Onion	47.5-82.5	0.0396 (44.4)	N.R.	N.R.	0.0448 (50.2)	0.0135-0.149 (15.1-166)	>0.357 (>400)	N.A.	0.93996
Ryegrass	85.0-95.0	0.357 (400)	N.R.	N.R.	>0.357 (>400)	N.A.	>0.357 (>400)	N.A.	N.R
Wheat	87.5-92.5	0.357 (400)	N.R.	N.R.	>0.357 (>400)	N.A.	>0.357 (>400)	N.A.	N.R
Bean	82.5-90.0	0.357 (400)	N.R.	N.R.	>0.357 (>400)	N.A.	>0.357 (>400)	N.A.	N.R
Cabbage	87.5-97.5	0.119 (133)	N.R.	N.R.	>0.119 (>133)	N.A.	>0.119 (>133)	N.A.	N.R.
Lettuce	2.5-77.5	0.0015 (1.65)	N.R.	N.R.	0.0015 (1.66)	1.85×10^{-4}-0.0119 (0.2069-13.3)	0.0053 (5.96)	0.0013-0.0219 (1.45-24.5)	0.88477
Oilseed Rape	70.0-95.0	0.0132 (14.8)	N.R.	N.R.	>0.119 (>133)	N.A.	>0.119 (>133)	N.A.	N.R.
Soybean	90.0-100.0	0.357 (400)	N.R.	N.R.	>0.357 (>400)	N.A.	>0.357 (>400)	N.A.	N.R
Tomato	42.5-82.5	0.0396 (44.4)	N.R.	N.R.	0.0251 (28.1)	0.0067-0.0933 (7.54-105)	>0.119 (>133)	N.A.	0.92227

[1] lbs a.i./A are presented first, followed by g a.i./ha in parentheses.
* range provided represents the range of the treatment means excluding the controls.
N/A- Not Applicable
N.R.- Not Reported

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

Mid-Study Emergence- Day 7 (reported by the study author)

Control	Corn	Onion	Ryegrass	Wheat	Bean	Cabbage	Lettuce	Oilseed Rape	Soybean	Tomato	Adj control
84.8 (55.0-100)	94.5 (90.0-97.5)	54.2 (35.0-70.0)	89.0 (82.5-95.0)	89.5 (85.0-92.5)	81.5 (75.0-87.5)	93.8 (87.5-97.5)	33.3 (2.5-77.5)	78.5 (70.0-95.0)	89.0 (82.5-95.0)	66.5 (42.5-85.0)	83.8 (55.0-100)

* provide the mean and range

Mid-Study Emergence- Day 14 (reported by the study author)

Control	Corn	Onion	Ryegrass	Wheat	Bean	Cabbage	Lettuce	Oilseed Rape	Soybean	Tomato	Adj control
89.3 (73.3-100)	94.5 (90.0-97.5)	67.1 (47.5-82.5)	89.5 (85.0-95.0)	90.5 (87.5-92.5)	83.0 (77.5-87.5)	93.8 (87.5-97.5)	33.3 (2.5-77.5)	79.5 (70.0-95.0)	94.0 (90.0-97.5)	64.5 (42.5-82.5)	87.8 (60-100)

* provide the mean and range

Emergence- Day 21 (reported by the study author)

Control	Corn	Onion	Ryegrass	Wheat	Bean	Cabbage	Lettuce	Oilseed Rape	Soybean	Tomato	Adj control
89.6 (73.3-100)	94.5 (90.0-97.5)	67.1 (47.5-82.5)	89.5 (85.0-95.0)	90.5 (87.5-92.5)	86.5 (82.5-90.0)	93.8 (87.5-97.5)	33.3 (2.5-77.5)	79.5 (70.0-95.0)	94.5 (90.0-100.0)	64.5 (42.5-82.5)	88.7 (60-100)

* provide the mean and range

Emergence values represent the mean (and range) % emergence from the treatment levels (excluding the controls). The mean (and range) of all appropriate species of the control and adjuvant control are reported separately in the respective columns.

Plant Injury Index (reported by the study author)											
Control	Corn	Onion	Ryegrass	Wheat	Bean	Cabbage	Lettuce	Oilseed Rape	Soybean	Tomato	Adj control
0-21	0-4.3	0-100	0-77	0-13	0-59	0-100	0-100	0-100	0-39	0-100	0-25

Plant injury values represent the range of replicate means with the controls and treatment levels respectively. Plant Injury was assessed using the following rating scale: 0, no effect; 10-30 slight effect (10- barely noticeable, 20- not apparently detrimental, 30- effect more pronounced); 40-60, moderate effect (40-moderate, recovery possible, 50-more lasting effect and recovery doubtful, 60- lasting effect and recovery doubtful); 70-90 severe effect (70- heavy injury w/ loss of leaves, 80- plant nearly destroyed w/ few surviving leaves, 90-occasional surviving leaves); 100, complete effect. This scale was adapted from: Frans, Robert E and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

C. VERIFICATION OF STATISTICAL RESULTS BY THE REVIEWER:

Statistical Method(s): Any species exhibiting an inhibition of $\geq 5\%$ relative to the negative control based on % survival, dry weight or plant height was statistically analyzed. The toxicity values were visually determined when inhibitions did not exceed 5% for a given endpoint. Prior to determining the toxicity values, the replicate data from the negative and solvent controls were compared using a Student's t-test to determine if a significant difference existed. Regardless of the results, all subsequent analyses were conducted using the negative control only. The reviewer tested each data set for normality using the Chi-square and Shapiro-Wilks tests and for homogeneity of variance using the Hartley and Bartlett's tests. If the data met these assumptions of ANOVA, the NOAEC values for plant weight and survival were determined using the parametric Dunnett's test (or Bonferonni's test for unequal replicates) and Williams' test. If the data did not meet these assumptions, the NOAEC value was determined using the non-parametric Kruskal-Wallis test. In all cases, the reviewer also compared the dose-response pattern (as determined by the % inhibitions) to the output of the statistical tests to determine if biological significance existed in the absence of statistical significance. These analyses were conducted using Toxstat statistical software for plant height and survival endpoints. The reviewer then attempted to determine the ECx values, 95% confidence intervals and slopes using the probit analysis via Nuthatch statistical software. Treatment levels were only included for dry weight and plant height in the analyses if two or more replicates contained surviving seedlings; those treatment levels with only one viable replicate were excluded. All analyses were conducted using the measured application rates. It should be noted that statistical analysis of the seedling emergence endpoint is not normally conducted because seedling emergence is usually a less sensitive endpoint as compared to dry weight, plant height, and survival endpoints. Total dry weight was calculated by multiplying the reported average dry weight per living plant by the number of survivors in that pot. Hypothesis testing for the dry weight endpoint was conducted with Dunnett's test except in cases where the assumptions of normality and equal variances were not met. In these cases, Bonferroni's t-test was used. Point estimates were derived using linear interpolation. All dry weight statistical analysis and endpoints were derived using TOXCALC (v5.0.32; Tidepool Scientific Software, McKinleyville, CA).

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

Table 6: Reported effect of BAS 800 02 H on Seedling Emergence

Species	Results summary for dry weight (lbs a.i./A and g a.i./ha; based on mean-measured concentrations; reported by the reviewer)[1]									
	g*	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	Slope	Std Err
Corn	11.933-12.935	0.319 (357)	0.0376 (42.1)	N/A	>0.319 (>357)	N/A	>0.319 (>357)	N/A	N.D	N.D.
Onion	0.0603-0.1440	0.347 (389)	0.0056 (6.23)	<0.000-0.0103 (<0.000-11.5)	0.0121 (13.6)	<0.000-0.0309 (<0.000-34.5)	>0.347 (>389)	N/A	N.D.	N.D.
Ryegrass	0.0835-0.2225	0.0127 (14.2)	0.0012 (1.32)	5.4×10^{-6}-0.0236 (0.006-26.4)	0.0062 (6.97)	<0.000-0.0438 (<0.000-49.0)	0.0198 (22.2)	N.D.	N.D	N.D.
Wheat	1.3448-1.8723	0.111 (124)	0.0020 (2.2)	0.0001-0.1767 (0.06-198)	0.1189 (133)	N/A	>0.319 (>357)	N/A	N.D	N.D.
Bean	10.248-12.345	0.0376 (42.1)	0.0033 (3.75)	0.0014-0.0875 (1.62-98.0)	>0.319 (>357)	N/A	>0.319 (>357)	N/A	N.D.	N.D.
Cabbage	0.2850-2.9765	0.00143 (1.6)	0.0007 (0.836)	<0.000-0.0025 (<0.000-2.83)	0.0029 (3.25)	0.0017-0.0087 (1.89-9.75)	0.0166 (18.6)	0.0105-0.0225 (11.8-25.2)	N.D.	N.D.
Lettuce	0.007-0.8233	0.00392 (4.39)	0.0002 (0.2456)	<0.000-0.0014 (<0.000-1.58)	0.00087 (1.05)	<0.000-0.0082 (<0.000-9.14)	0.0052 (5.82)	<0.000-0.0094 (<0.000-10.5)	N.D.	N.D.
Oilseed Rape	0.7305-5.1945	0.00143 (1.6)	0.0016 (1.78)	<0.000-0.0020 (<0.000-2.27)	0.0027 (3.05)	0.0014-0.0041 (1.56-4.57)	0.0053 (5.94)	0.0012-0.0114 (1.34-12.8)	N.D	N.D.
Soybean	7.033-10.375	0.111 (124)	0.0020 (2.23)	8.9×10^{-4}-0.0699 (1.0-78.2)	0.2069 (232)	N/A	>0.319 (>357)	N/A	N.D	N.D.
Tomato	0.3777-1.4915	0.00143 (1.6)	0.0004 (0.4712)	<0.000-0.0024 (<0.000-2.73)	0.0019 (2.12)	<0.000-0.0032 (<0.000-3.60)	0.0033 (3.72)	0.0001-0.0075 (0.086-8.38)	N.D.	N.D.

[1] lbs a.i./A are presented first, followed by g a.i./ha in parentheses.
* range provided represents the range of the treatment means including the controls
N/A- Not Applicable
N.R.- Not Reported
N.D.-Not Determined

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

Table 6a: Reported effect of BAS 800 02 H on Seedling Emergence

Species	Results summary for plant height (lbs a.i./A; based on mean-measured concentrations; reported by the reviewer)									
	cm*	NOAEC	EC_{05}	95%CI	EC_{25}**	95%CI**	EC_{50}**	95%CI**	Slope	Std Err
Corn	73.6-77.1	0.319	>0.319	N/A	>0.319	N/A	>0.319	N/A	N/A	N/A
Onion	10.0-15.2	0.347	N.D.	N.D.	>0.347	N/A	>0.347	N/A	N.D.	N.D.
Ryegrass	10.2-15.9	0.0127	0.0007	1×10^{-5}-0.05	0.073	0.014-0.37	>0.319 (1.8)	N/A (0.27-12)	0.482	0.158
Wheat	36.8-41.3	0.319	N.D.	N.D.	>0.319	N/A	>0.319	N/A	N.D.	N.D.
Bean	40.0-46.7	0.319	>0.319	N/A	>0.319	N/A	>0.319	N/A	0.230	1.53
Cabbage	9.3-16.5	0.0321	0.025	0.0056-0.11	0.071	0.040-0.12	>0.112 (0.15)	N/A (0.082-0.26)	2.14	1.04
Lettuce	2.0-11.3[1]	0.000629	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Oilseed Rape	13.7-25.7	0.00392	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Soybean	29.0-39.4	0.0127	0.0003	4.9×10^{-9}-1.6	0.28	0.013-5.8	>0.319 (34)	N/A (0.037-$3 \times 10^{+4}$)	0.323	0.188
Tomato	8.3-14.0	0.00143	0.0003	3×10^{-6}-0.021	0.0030	0.00047-0.020	>0.0127 (0.017)	N/A (0.0035-0.094)	0.896	0.487

* range provided represents the range of the treatment means including the controls.
** Point estimates are also provided in parentheses for EC_{25} and EC_{50} values that exceed the highest test concentration, if appropriate (see Reviewer's comments).
[1] The treatment level yielding a mean of 11.7 g was considered to be an outlier and was excluded from statistical analysis.
N/A- Not Applicable
N.R.- Not Reported

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547203   EPA MRID Number: 47127918

Table 6b: Reported effect of BAS 800 02 H on Seedling Emergence

Species	Results summary for survival (lbs a.i./A; based on mean-measured concentrations; reported by the reviewer)									
	%*	NOAEC	EC_{05}	95%CI	EC_{25}**	95%CI**	EC_{50}**	95%CI**	Slope	Std Err
Corn	100	0.319	>0.319	N/A	>0.319	N/A	>0.319	N/A	N/A	N/A
Onion	67.5-97.2	0.0321	0.024	0.00021-2.9	0.23	0.050-1.1	>0.347 (1.1)	N/A (0.073-16)	0.997	0.871
Ryegrass	57.5-100	0.00483	8.6×10^{-5}	5.8×10^{-9}-1.3	0.034	0.00094-1.2	>0.319 (2.1)	N/A (0.036-130)	0.374	0.214
Wheat	96.9-100	0.319	>0.319	N/A	>0.319	N/A	>0.319	N/A	N/A	N/A
Bean	67.0-100	0.0127	0.0033	2.7×10^{-5}-0.39	0.12	0.020-0.72	>0.319 (1.5)	N/A (0.17-13)	0.620	0.296
Cabbage	9.1-100	0.000629	0.00014	2×10^{-5}-0.0009	0.00097	0.00027-0.0035	0.0038	0.0015-0.0093	1.14	0.193
Lettuce	0-95.2	0.000629	0.0003	2×10^{-5}-0.0044	0.0012	0.00020-0.0065	0.0029	0.00092-0.0095	1.66	0.601
Oilseed Rape	3.6-97.5	<0.00143	0.0002	1.4×10^{-5}-0.0021	0.00087	0.0002-0.0048	0.0026	0.00078-0.0088	1.40	0.366
Soybean	81.0-100	0.111	N.D.	N.D.	>0.319	N/A	>0.319	N/A	N.D.	N.D.
Tomato	0-93.1	0.00143	0.0006	7.2×10^{-5}-0.0048	0.0021	0.00062-0.0075	0.0053	0.0025-0.011	1.73	0.573

* range provided represents the range of the treatment means including the controls.

** Point estimates are also provided in parentheses for EC_{25} and EC_{50} values that exceed the highest test concentration, if appropriate (see Reviewer's comments).

N/A- Not Applicable

N.R.- Not Reported

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

Mid-Study Emergence- Day 7 (reported by the reviewer)

Control	Corn	Onion	Ryegrass	Wheat	Bean	Cabbage	Lettuce	Oilseed Rape	Soybean	Tomato	Adj control
84.8 (55.0-100)	94.5 (90.0-97.5)	54.2 (35.0-70.0)	89.0 (82.5-95.0)	89.5 (85.0-92.5)	81.5 (75.0-87.5)	93.8 (87.5-97.5)	33.3 (2.5-77.5)	78.5 (70.0-95.0)	89.0 (82.5-95.0)	66.5 (42.5-85.0)	83.8 (55.0-100)

* provide the mean and range

Mid-Study Emergence- Day 14 (reported by the reviewer)

Control	Corn	Onion	Ryegrass	Wheat	Bean	Cabbage	Lettuce	Oilseed Rape	Soybean	Tomato	Adj control
89.3 (73.3-100)	94.5 (90.0-97.5)	67.1 (47.5-82.5)	89.5 (85.0-95.0)	90.5 (87.5-92.5)	83.0 (77.5-87.5)	93.8 (87.5-97.5)	33.3 (2.5-77.5)	79.5 (70.0-95.0)	94.0 (90.0-97.5)	64.5 (42.5-82.5)	87.8 (60-100)

* provide the mean and range

Emergence- Day 21 (reported by the reviewer)

Control	Corn	Onion	Ryegrass	Wheat	Bean	Cabbage	Lettuce	Oilseed Rape	Soybean	Tomato	Adj control
89.6 (73.3-100)	94.5 (90.0-97.5)	67.1 (47.5-82.5)	89.5 (85.0-95.0)	90.5 (87.5-92.5)	86.5 (82.5-90.0)	93.8 (87.5-97.5)	33.3 (2.5-77.5)	79.5 (70.0-95.0)	94.5 (90.0-100.0)	64.5 (42.5-82.5)	88.7 (60-100)

* provide the mean and range

Emergence values represent the mean (and range) % emergence from the treatment levels (excluding the controls). The mean (and range) of all appropriate species of the control and adjuvant control are reported separately in the respective columns.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

Plant Injury Index (reported by the reviewer)											
Control	Corn	Onion	Ryegrass	Wheat	Bean	Cabbage	Lettuce	Oilseed Rape	Soybean	Tomato	Adj control
0-21	0-4.3	0-100	0-77	0-13	0-59	0-100	0-100	0-100	0-39	0-100	0-25

Plant injury values represent the range of replicate means with the controls and treatment levels respectively. Plant Injury was assessed using the following rating scale: 0, no effect; 10-30 slight effect (10- barely noticeable, 20- not apparently detrimental, 30- effect more pronounced); 40-60, moderate effect (40-moderate, recovery possible, 50-more lasting effect and recovery doubtful, 60- lasting effect and recovery doubtful); 70-90 severe effect (70- heavy injury w/ loss of leaves, 80- plant nearly destroyed w/ few surviving leaves, 90-occasional surviving leaves); 100, complete effect. This scale was adapted from: Frans, Robert E and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

Monocot

EC_{05}/IC_{05}: 0.0012 lbs a.i./A (1.32 g a.i./ha)   95% C.I.: 5.4×10^{-6}-0.0236 lbs a.i./A (0.006-26.4 g a.i./ha)
EC_{25}/IC_{25}: 0.0062 lbs a.i./A (6.97 g a.i./ha)   95% C.I.: <0.0000-0.0468 lbs a.i./A (<0.0000-49.0 g a.i./ha)
EC_{50}/IC_{50}: 0.0198 lbs a.i./A (22.2 g a.i./ha)   95% C.I.: N.D
NOAEC: 0.0127 lbs a.i./A (14.2 g a.i./ha)
Slope: N.D.
Std err: N.D.
Most sensitive monocot: Ryegrass
Most sensitive parameter: Dry Weight

Dicot

EC_{05}/IC_{05}: 0.0002 lbs a.i./A (0.2241 g a.i./ha)   95% C.I.: 1.4×10^{-5}-0.0021 lbs a.i./A (0.0157-2.35 g a.i./ha)
EC_{25}/IC_{25}: 0.00087 lbs a.i./A (1.05 g a.i./ha)   95% C.I.: 0.00016-0.0048 lbs a.i./A (0.1792-5.38 g a.i./ha)
EC_{50}/IC_{50}: 0.0026 lbs a.i./A (2.91 g a.i./ha)   95% C.I.: 0.00078-0.0088 lbs a.i./A (0.8738-9.86 g a.i./ha)
NOAEC: <0.00143 lbs a.i./A (<1.6 g a.i./ha)
Slope: 1.40
Std err: 0.366
Most sensitive dicot: Oilseed Rape
Most sensitive parameter: Percent Survival

D. STUDY DEFICIENCIES:

The deviation associated with the inability to determine a critical toxicity NOAEC value for oilseed rape, the most sensitive dicot species, impact the acceptability of the study for APVMA. It should be noted, however, that U.S. EPA classifies the study as "acceptable" because an EC05 value was derived for the oilseed rape survival endpoint.

E. REVIEWER'S COMMENTS:

The reviewer's results are based on the measured application rates and were determined by comparing the treatment data to the negative control only. The study authors determined all toxicity values using the nominal application rates and by comparing treatment data to the pooled control. The study authors derived all dry weight endpoints on a "per plant" rather than "per pot" basis; therefore, the reviewer recalculated all dry weight

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

endpoints by multiplying the reported average dry weight per living plant by the number of survivors in that pot. Aside from these differences, the reviewer similarly identified sensitivity of the same monocot and dicot species as the study authors. The reviewer's results are reported in the Executive Summary and Conclusions sections of this DER. In addition, given that PMRA derives a species sensitivity distribution of the EC_{50} values to estimate the regulatory endpoint, point estimates are also provided for EC_{50} (and EC_{25}) values that are greater than the highest test concentration when it is possible to derive a point estimate along with 95% confidence limits. If point estimates cannot be derived, the EC_{50} (and EC_{25}) value is reported as a "greater than" the highest test concentration.

The study authors reported that there were significant differences between the control group means for height of wheat, lettuce and tomato; however, no differences were apparent in weight, height, or survival and the difference was not considered to be an effect of the adjuvant.

The reviewer's analysis of onion survival did not detect any significant differences at any treatment level relative to the negative control. However, the reviewer felt that the 12.3 and 29.9% inhibitions at the measured 0.112 and 0.347 lbs a.i./A treatment levels, respectively, were biologically significant. Therefore, the reviewer visually determined the NOAEC value to be 0.0321 lbs a.i./A.

A significant inhibition in ryegrass % survival was detected at the 0.111 lbs a.i./A treatment level relative to the negative control. However,, the reviewer visually determined the survival NOAEC value to be 0.00483 lbs a.i./A based on the 7.5% inhibition at this level and the 19.8-42.5% inhibitions at the remaining treatment levels.

The reviewer's analysis of bean % survival did not detect any significant differences at the treatment levels relative to the negative control. However, the reviewer visually determined the NOAEC value to be 0.0127 lbs a.i./A based on the 6.3% inhibition at this level and the inhibitions of 13.9-33.0% at the 0.0376-0.319 lbs a.i./A treatment levels.

The reviewer's non-parametric analysis for cabbage plant height was unable to detect any significant differences at any treatment level; therefore, the reviewer visually determined the NOAEC value to be 0.0321 lbs a.i./A based on the observed % inhibitions. The reviewer also visually determined the NOAEC value for cabbage survival to be 0.000629 lbs a.i./A based on the 0% inhibition at this level, relative to the negative control, and the ≥21.3% inhibitions at the remaining treatment levels.

The reviewer was unable to determine the ECx values for lettuce plant height. The two highest treatment levels (0.0321 and 0.112 lbs a.i./A) were excluded from analyses because survival was 0% in all replicates in which emergence occurred, the 0.0127 lbs a.i./A treatment level was excluded due to only one replicate containing surviving seedlings, and the 0.00392 lbs a.i./A treatment level was excluded because the value did not appear dose-responsive and was identified as an outlier by the study authors. The remaining two treatment levels (0.000629 and 0.00143 lbs a.i./A) did not exhibit a clear dose-response pattern and the probit analysis was considered to be an unsuitable model due to the lack of three or more distinct isotone means.

The reviewer was unable to determine the ECx values for oilseed rape plant height due to the lack of three or more distinct isotone means. However, the reviewer was able to visually determine the NOAEC value to be 0.00392 lbs a.i./A based on the -6.5 and -26.7% inhibitions at the 0.00143 and 0.00392 lbs a.i./A treatment levels, respectively, and the 32.8% inhibition at the 0.0127 lbs a.i./A treatment level. The NOAEC for oilseed rape % survival of <0.00143 lbs a.i./A was visually determined based on a 13.6% inhibition of survival at the lowest treatment level..

The in-life portion of the definitive seedling emergence test with corn, ryegrass, wheat, bean and soybean was

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

conducted from June 28 to July 19, 2007 and with cabbage, oilseed rape, onion, lettuce and tomato from June 29 to July 20, 2007.

F. CONCLUSIONS:

This toxicity study is classified as ACCEPTABLE by U.S. EPA, FULLY RELIABLE by PMRA, and RELIABLE WITH RESTRICTIONS by APVMA. Ryegrass was the most sensitive monocot, based on dry weight, with NOAEC, EC_{05} EC_{25}, and EC_{50} values of 0.0127, 0.0012, 0.0062, and 0.0198 lbs a.i./A, respectively (equivalent to 14.2, 1.32, 6.97, and 22.2 g a.i./ha, respectively) Oilseed rape was the most sensitive dicot, based on % survival, with NOAEC, EC_{05}, EC_{25} and EC_{50} values of <0.00143, 0.0002, 0.00087, and 0.0026 lbs a.i./A, respectively (equivalent to <1.6, 0.2241, 1.05, and 2.91 g a.i./ha, respectively).

Most sensitive monocot and EC_{25}: Ryegrass (Dry Weight), 0.0062 lbs a.i./A (6.97 g a.i./ha)
Most sensitive dicot and EC_{25}: Oilseed Rape (Percent Survival), 0.00087 lbs a.i./A (1.05 g a.i./ha)

III. REFERENCES:

U.S. Environmental Protection Agency. 1996. Series 850- Ecological Effects Test Guidelines (*draft*), OPPTS Number 850.4100: Terrestrial Plant Toxicity, Tier I (Seedling Emergence).

U.S. Environmental Protection Agency. 1996. Series 850- Ecological Effects Test Guidelines (*draft*), OPPTS Number 850.4225: Terrestrial Plant Toxicity, Tier II (Seedling Emergence).

Frans, Robert E. and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 *in* B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

SAS Institute, Inc. 1999. SAS Proprietary Software Version 8, Cary, NC, SAS Institute, Inc.

Bruce, Robert D. and Donald J. Versteeg. 1992. A Statistical Procedure for Modeling Continuous Data. *Environmental Toxicology and Chemistry*, 11: 1485-1494.

Norberg-King, T.J. 1993. *A Linear Interpolation Method for Sublethal Toxicity: The Inhibition Concentration (ICp) Approach*. Version 2.0. U.S. Environmental Protection Agency. National Effluent Toxicity Assessment Center, Duluth, Minnesota. Technical Report 03-93.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

```
Onion plant height (cm), Day 21; lbs a.i./A
File: 7918nh      Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
-----------------------------------------------------------------------------


INTERVAL      <-1.5      -1.5 to <-0.5     -0.5 to 0.5    >0.5 to 1.5    >1.5

              ____       _____            _____         _____        ____


EXPECTED      1.809      6.534             10.314         6.534         1.809
OBSERVED      0          8                 10             9             0


-----------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =   4.8872
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Onion plant height (cm), Day 21; lbs a.i./A
File: 7918nh      Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
-----------------------------------------------------------------------------


D =    73.162

W =     0.957

Critical W (P = 0.05) (n = 27) = 0.923
Critical W (P = 0.01) (n = 27) = 0.894
-----------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Onion plant height (cm), Day 21; lbs a.i./A
File: 7918nh      Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
-----------------------------------------------------------------------------

Calculated H statistic (max Var/min Var) =    4.52
Closest, conservative, Table H statistic =  216.0  (alpha = 0.01)

Used for Table H ==>    R (# groups) =   7,    df (# reps-1) =       3
Actual values    ==>    R (# groups) =   7,    df (# avg reps-1) =   2.86
                                               (average df used)


-----------------------------------------------------------------------------

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).
```

```
Onion plant height (cm), Day 21; lbs a.i./A
File: 7918nh          Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance
-------------------------------------------------------------------------------

Calculated B statistic =    1.76
Table Chi-square value =   16.81  (alpha = 0.01)
Table Chi-square value =   12.59  (alpha = 0.05)

Average df used in calculation  ==>  df (avg n - 1) =   2.86
Used for Chi-square table value ==>  df (#groups-1) =   6
-------------------------------------------------------------------------------

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Onion plant height (cm), Day 21; lbs a.i./A
File: 7918nh          Transform: NO TRANSFORMATION

                         ANOVA TABLE
-------------------------------------------------------------------------------

SOURCE            DF              SS                MS              F
-------------------------------------------------------------------------------

Between           6.            74.252           12.375          3.383

Within (Error)    20            73.163            3.658
-------------------------------------------------------------------------------

Total             26           147.414
-------------------------------------------------------------------------------

   Critical F value =   2.60  (0.05,6,20)
   Since  F > Critical F  REJECT  Ho:All groups equal


Onion plant height (cm), Day 21; lbs a.i./A
File: 7918nh          Transform: NO TRANSFORMATION

     BONFERRONI T-TEST    -    TABLE 1 OF 2            Ho:Control<Treatment
-------------------------------------------------------------------------------
                         TRANSFORMED    MEAN CALCULATED IN
GROUP    IDENTIFICATION      MEAN        ORIGINAL UNITS     T STAT  SIG
-----  ----------------   -----------  -------------------  ------  ---
  1        neg control     12.300           12.300
  2           0.00143      15.200           15.200          -2.144
  3           0.00392      13.925           13.925          -1.202
  4           0.0127       13.900           13.900          -1.183
  5           0.0321       11.375           11.375           0.684
  6           0.112         9.975            9.975           1.719
  7           0.347        13.100           13.100          -0.548
-------------------------------------------------------------------------------
Bonferroni T table value = 2.61     (1 Tailed Value, P=0.05,  df=20,6)
```

```
Onion plant height (cm), Day 21; lbs a.i./A
File: 7918nh          Transform: NO TRANSFORMATION

        BONFERRONI T-TEST    -    TABLE 2 OF 2          Ho:Control<Treatment
-------------------------------------------------------------------------------
                          NUM OF   Minimum Sig Diff  % of      DIFFERENCE
GROUP      IDENTIFICATION  REPS    (IN ORIG. UNITS)  CONTROL   FROM CONTROL
-----  ------------------  ------  ----------------  -------   ------------
  1          neg control    4
  2             0.00143     4           3.534         28.7       -2.900
  3             0.00392     4           3.534         28.7       -1.625
  4             0.0127      4           3.534         28.7       -1.600
  5             0.0321      4           3.534         28.7        0.925
  6             0.112       4           3.534         28.7        2.325
  7             0.347       3           3.817         31.0       -0.800
-------------------------------------------------------------------------------
```

```
Onion plant height (cm), Day 21; lbs a.i./A
File: 7918nh          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
-------------------------------------------------------------------------------
GROUP                          ORIGINAL     TRANSFORMED     ISOTONIZED
           IDENTIFICATION    N   MEAN         MEAN            MEAN
------  --------------------  ---  ---------   -----------   ----------
  1          neg control    4   12.300       12.300          12.300
  2             0.00143     4   15.200       15.200          12.875
  3             0.00392     4   13.925       13.925          12.875
  4             0.0127      4   13.900       13.900          12.875
  5             0.0321      4   11.375       11.375          12.875
  6             0.112       4    9.975        9.975          12.875
  7             0.347       3   13.100       13.100          13.100
-------------------------------------------------------------------------------
```

```
Onion plant height (cm), Day 21; lbs a.i./A
File: 7918nh          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
-------------------------------------------------------------------------------
                ISOTONIZED   CALC.      SIG     TABLE      DEGREES OF
    IDENTIFICATION   MEAN   WILLIAMS   P=.05   WILLIAMS    FREEDOM
------------------  ----------  ----------  -----  ----------  ----------
      neg control    12.300
         0.00143     12.875    0.425               1.72       k= 1, v=20
         0.00392     12.875    0.425               1.81       k= 2, v=20
         0.0127      12.875    0.425               1.83       k= 3, v=20
         0.0321      12.875    0.425               1.85       k= 4, v=20
         0.112       12.875    0.425               1.86       k= 5, v=20
         0.347       13.100    0.548               1.86       k= 6, v=20
-------------------------------------------------------------------------------
s =    1.913
Note: df used for table values are approximate when v > 20.

Onion % survival, Day 21; lbs a.i./A
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
File: 7918ns          Transform: NO TRANSFORM

      t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
-----------------------------------------------------------------------------
  GRP1 (SOLVENT CRTL) MEAN =      89.1000    CALCULATED t VALUE =     -1.6342
  GRP2 (BLANK CRTL) MEAN   =      97.2250    DEGREES OF FREEDOM =     6
  DIFFERENCE IN MEANS      =      -8.1250
-----------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 6) =   2.447    NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =   3.707    NO significant difference at alpha=0.01

Onion % survival, Day 21; lbs a.i./A
File: 7918ns          Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
-----------------------------------------------------------------------------


INTERVAL      <-1.5      -1.5 to <-0.5     -0.5 to 0.5    >0.5 to 1.5     >1.5

              _____      _____       _____     _____      _____

EXPECTED      1.876        6.776            10.696          6.776         1.876
OBSERVED      0            8                12              8             0


-----------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =   4.3532
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Onion % survival, Day 21; lbs a.i./A
File: 7918ns          Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
-----------------------------------------------------------------------------

D = 9499.992

W =    0.894

Critical W (P = 0.05) (n = 28) = 0.924
Critical W (P = 0.01) (n = 28) = 0.896
-----------------------------------------------------------------------------

Data FAIL normality test. Try another transformation.

Warning -  The two homogeneity tests are sensitive to non-normal data and
           should not be performed.



Onion % survival, Day 21; lbs a.i./A
File: 7918ns          Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
-----------------------------------------------------------------------------

Calculated H statistic (max Var/min Var) =   217.79
Closest, conservative, Table H statistic =   216.0   (alpha = 0.01)
```

```
Used for Table H ==>      R (# groups) =   7,    df (# reps-1) =        3
Actual values    ==>      R (# groups) =   7,    df (# avg reps-1) =  3.00

-------------------------------------------------------------------------

Data FAIL homogeneity test. Try another transformation.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).




Onion % survival, Day 21; lbs a.i./A
File: 7918ns       Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance
-------------------------------------------------------------------------

Calculated B statistic =    22.01
Table Chi-square value =    16.81   (alpha = 0.01)
Table Chi-square value =    12.59   (alpha = 0.05)

Average df used in calculation  ==>   df (avg n - 1) =   3.00
Used for Chi-square table value ==>   df (#groups-1) =   6
-------------------------------------------------------------------------

Data FAIL homogeneity test at 0.01 level. Try another transformation.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Onion % survival, Day 21; lbs a.i./A
File: 7918ns       Transform: NO TRANSFORMATION

          KRUSKAL-WALLIS ANOVA BY RANKS   -  TABLE 1 OF 2
-------------------------------------------------------------------------
                       TRANSFORMED    MEAN CALCULATED IN      RANK
GROUP    IDENTIFICATION    MEAN        ORIGINAL UNITS          SUM
-----  --------------    ----------   ------------------    --------
  1       neg control     89.100          89.100           63.500
  2         0.00143       94.450          94.450           76.500
  3         0.00392       90.975          90.975           69.000
  4         0.0127        87.700          87.700           56.500
  5         0.0321        84.125          84.125           45.000
  6         0.112         78.125          78.125           45.000
  7         0.347         62.500          62.500           50.500
-------------------------------------------------------------------------

  Calculated H Value =   3.462       Critical H Value Table =  12.590
  Since  Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.




Onion % survival, Day 21; lbs a.i./A
File: 7918ns       Transform: NO TRANSFORMATION

 DUNNS MULTIPLE COMPARISON  -  KRUSKAL-WALLIS  -  TABLE 2 OF 2
-------------------------------------------------------------------------
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
                                                     GROUP
                         TRANSFORMED  ORIGINAL  0 0 0 0 0 0 0
GROUP    IDENTIFICATION    MEAN        MEAN     7 6 5 4 1 3 2
-----    --------------  -----------  --------  - - - - - - -
  7             0.347      62.500     62.500    \
  6             0.112      78.125     78.125    . \
  5             0.0321     84.125     84.125    . . \
  4             0.0127     87.700     87.700    . . . \
  1          neg control  89.100      89.100    . . . . \
  3             0.00392    90.975     90.975    . . . . . \
  2             0.00143    94.450     94.450    . . . . . . \
-----------------------------------------------------------------------------
```

```
* = significant difference (p=0.05)          . = no significant difference
Table q value (0.05,7) = 3.038               SE =   5.669

Estimates of EC%
---------------------------------------------------------------------------
Parameter   Estimate     95% Bounds       Std.Err.  Lower Bound
                       Lower    Upper                /Estimate
EC5          0.024    0.00021     2.9       1.0        0.0085
EC10         0.056    0.0020      1.6       0.71       0.035
EC25         0.23     0.050       1.1       0.32       0.22
EC50         1.1      0.073       16.       0.57       0.068

        Slope =   0.997  Std.Err. =    0.871


Goodness of fit: p =      1.0  based on DF=       4.0       21.
---------------------------------------------------------------------------
7918NS : Onion % survival, Day 21; lbs a.i./A
---------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
---------------------------------------------------------------------------
    Dose     #Reps.    Obs.     Pred.     Obs.     Pred.    %Change
                       Mean     Mean    -Pred.   %Control

    0.00     4.00      89.1     91.3     -2.23     100.      0.00
 0.00143     4.00      94.5     91.1      3.31     99.8      0.203
 0.00392     4.00      91.0     90.6      0.327    99.3      0.742
  0.0127     4.00      87.7     88.9     -1.16     97.3      2.70
  0.0321     4.00      84.1     85.5     -1.40     93.6      6.35
   0.112     4.00      78.1     76.5      1.63     83.8      16.2
   0.347     4.00      62.5     63.0     -0.482    69.0      31.0

!!!Warning: EC50 not bracketed by doses evaluated.

Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7918gh        Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
---------------------------------------------------------------------------
 GRP1 (SOLVENT CRTL) MEAN =     15.2250    CALCULATED t VALUE =     -1.5331
 GRP2 (BLANK CRTL) MEAN   =     16.6750    DEGREES OF FREEDOM =      6
 DIFFERENCE IN MEANS      =     -1.4500
---------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 6) =  2.447   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =  3.707   NO significant difference at alpha=0.01

Ryegrass plant height (cm), Day 21; lbs a.i./A
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
File: 7918gh       Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
------------------------------------------------------------------------

INTERVAL    <-1.5     -1.5 to <-0.5    -0.5 to 0.5    >0.5 to 1.5    >1.5
            _____      _____        _____       _____     _____

EXPECTED    1.608        5.808           9.168          5.808      1.608
OBSERVED    0           10               6              8          0


------------------------------------------------------------------------

Calculated Chi-Square goodness of fit test statistic =    8.1636
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7918gh       Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
------------------------------------------------------------------------

D =    42.707

W =    0.920

Critical W (P = 0.05) (n = 24) = 0.916
Critical W (P = 0.01) (n = 24) = 0.884
------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7918gh       Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
------------------------------------------------------------------------

Calculated H statistic (max Var/min Var) =    5.11
Closest, conservative, Table H statistic = 184.0   (alpha = 0.01)

Used for Table H ==>    R (# groups) =  6,    df (# reps-1) =       3
Actual values    ==>    R (# groups) =  6,    df (# avg reps-1) = 3.00


------------------------------------------------------------------------

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).



Ryegrass plant height (cm), Day 21; lbs a.i./A
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
File: 7918gh        Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance
------------------------------------------------------------------------------

Calculated B statistic =    2.48
Table Chi-square value =   15.09   (alpha = 0.01)
Table Chi-square value =   11.07   (alpha = 0.05)

Average df used in calculation  ==>   df (avg n - 1) =   3.00
Used for Chi-square table value ==>   df (#groups-1) =   5
------------------------------------------------------------------------------

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7918gh        Transform: NO TRANSFORMATION

                            ANOVA TABLE
------------------------------------------------------------------------------

SOURCE            DF            SS              MS              F
------------------------------------------------------------------------------

Between            5          88.932          17.786          7.495

Within (Error)    18          42.707           2.373
------------------------------------------------------------------------------
Total             23         131.640
------------------------------------------------------------------------------

  Critical F value =    2.77   (0.05,5,18)
  Since  F > Critical F   REJECT   Ho:All groups equal



Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7918gh        Transform: NO TRANSFORMATION

     DUNNETTS TEST    -    TABLE 1 OF 2              Ho:Control<Treatment
------------------------------------------------------------------------------
                          TRANSFORMED    MEAN CALCULATED IN
GROUP     IDENTIFICATION     MEAN        ORIGINAL UNITS     T STAT   SIG
-----  ---------------    -----------   ------------------  ------   ---
  1         neg control     15.225          15.225
  2            0.00483      14.300          14.300           0.849
  3            0.0127       13.900          13.900           1.216
  4            0.0376       11.400          11.400           3.512    *
  5            0.111        10.250          10.250           4.567    *
  6            0.319        10.650          10.650           4.200    *
------------------------------------------------------------------------------
Dunnett table value =   2.41     (1 Tailed Value, P=0.05,  df=18,5)



Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7918gh        Transform: NO TRANSFORMATION
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
        DUNNETTS TEST    -    TABLE 2 OF 2              Ho:Control<Treatment
--------------------------------------------------------------------------------
                             NUM OF   Minimum Sig Diff  % of      DIFFERENCE
GROUP      IDENTIFICATION    REPS     (IN ORIG. UNITS)  CONTROL   FROM CONTROL
-----  -------------------   ------   ----------------  -------   ------------
  1         neg control       4
  2              0.00483      4              2.625       17.2        0.925
  3              0.0127       4              2.625       17.2        1.325
  4              0.0376       4              2.625       17.2        3.825
  5              0.111        4              2.625       17.2        4.975
  6              0.319        4              2.625       17.2        4.575
--------------------------------------------------------------------------------
```

```
Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7918gh          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
--------------------------------------------------------------------------------
GROUP                            ORIGINAL     TRANSFORMED    ISOTONIZED
          IDENTIFICATION    N     MEAN          MEAN           MEAN
------  -------------------  ---  ----------   -----------   -----------
  1         neg control      4    15.225        15.225        15.225
  2              0.00483     4    14.300        14.300        14.300
  3              0.0127      4    13.900        13.900        13.900
  4              0.0376      4    11.400        11.400        11.400
  5              0.111       4    10.250        10.250        10.450
  6              0.319       4    10.650        10.650        10.450
--------------------------------------------------------------------------------
```

```
Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7918gh          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
--------------------------------------------------------------------------------
                   ISOTONIZED   CALC.      SIG      TABLE      DEGREES OF
      IDENTIFICATION   MEAN     WILLIAMS   P=.05    WILLIAMS    FREEDOM
--------------------  ----------  ---------  -----   ----------  -----------
        neg control    15.225
             0.00483   14.300     0.849               1.73       k= 1, v=18
             0.0127    13.900     1.217               1.82       k= 2, v=18
             0.0376    11.400     3.512      *        1.85       k= 3, v=18
             0.111     10.450     4.384      *        1.86       k= 4, v=18
             0.319     10.450     4.384      *        1.87       k= 5, v=18
--------------------------------------------------------------------------------
s =    1.540
Note: df used for table values are approximate when v > 20.
```

```
Estimates of EC%
--------------------------------------------------------------------------------
Parameter   Estimate      95% Bounds        Std.Err.   Lower Bound
                        Lower     Upper                 /Estimate
EC5          0.00071   1.0E-05    0.050      0.89        0.014
EC10         0.0040    0.00017    0.095      0.66        0.043
EC25         0.073     0.014      0.37       0.34        0.20
EC50         1.8       0.27       12.        0.40        0.15
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
            Slope =    0.482  Std.Err. =    0.158


Goodness of fit: p =      0.18  based on DF=      3.0      18.
------------------------------------------------------------------------
7918GH : Ryegrass plant height (cm), Day 21; lbs a.i./A
------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
------------------------------------------------------------------------

   Dose      #Reps.    Obs.     Pred.     Obs.     Pred.    %Change
                       Mean     Mean     -Pred.   %Control

     0.00     4.00     15.2     15.4    -0.224    100.      0.00
  0.00483     4.00     14.3     13.8     0.499    89.3      10.7
   0.0127     4.00     13.9     13.2     0.749    85.1      14.9
   0.0376     4.00     11.4     12.2    -0.841    79.2      20.8
    0.111     4.00     10.3     11.1    -0.899    72.2      27.8
    0.319     4.00     10.7     9.93     0.715    64.3      35.7
```

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

```
Ryegrass % survival, Day 21; lbs a.i./A
File: 7918gs       Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
------------------------------------------------------------------------------
 GRP1 (SOLVENT CRTL) MEAN =   100.0000    CALCULATED t VALUE =    1.0000
 GRP2 (BLANK CRTL) MEAN   =    97.5000    DEGREES OF FREEDOM =    6
 DIFFERENCE IN MEANS      =     2.5000
------------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 6) =  2.447   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =  3.707   NO significant difference at alpha=0.01

Ryegrass % survival, Day 21; lbs a.i./A
File: 7918gs       Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
------------------------------------------------------------------------------

INTERVAL     <-1.5      -1.5 to <-0.5     -0.5 to 0.5    >0.5 to 1.5    >1.5
            _____      _____      _____     _____    ____

EXPECTED    1.608         5.808             9.168          5.808      1.608
OBSERVED    0             5                 13             6          0

------------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =   4.9364
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Ryegrass % survival, Day 21; lbs a.i./A
File: 7918gs       Transform: NO TRANSFORMATION
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

```
Shapiro Wilks test for normality
-----------------------------------------------------------------------------

D = 4625.483

W =    0.927

Critical W (P = 0.05) (n = 24) = 0.916
Critical W (P = 0.01) (n = 24) = 0.884
-----------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Ryegrass % survival, Day 21; lbs a.i./A
File: 7918gs        Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance
-----------------------------------------------------------------------------

These two tests can not be performed because at least one group has
zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.


-----------------------------------------------------------------------------


Ryegrass % survival, Day 21; lbs a.i./A
File: 7918gs        Transform: NO TRANSFORMATION

            KRUSKAL-WALLIS ANOVA BY RANKS   -   TABLE 1 OF 2
-----------------------------------------------------------------------------
                         TRANSFORMED   MEAN CALCULATED IN    · RANK
GROUP      IDENTIFICATION     MEAN        ORIGINAL UNITS        SUM
----- ------------------- -----------  ------------------- -----------
  1          neg control   100.000          100.000          84.000
  2              0.00483    92.500           92.500          69.000
  3              0.0127     73.425           73.425          38.000
  4              0.0376     80.225           80.225          49.000
  5              0.111      57.500           57.500          24.000
  6              0.319      69.175           69.175          36.000
-----------------------------------------------------------------------------

   Calculated H Value =  13.056       Critical H Value Table =  11.070
   Since  Calc H > Crit H   REJECT Ho:All groups are equal.



Ryegrass % survival, Day 21; lbs a.i./A
File: 7918gs        Transform: NO TRANSFORMATION

 DUNNS MULTIPLE COMPARISON -  KRUSKAL-WALLIS  -   TABLE 2 OF 2
-----------------------------------------------------------------------------
                                            GROUP
                 TRANSFORMED   ORIGINAL   0 0 0 0 0 0
GROUP  IDENTIFICATION   MEAN       MEAN     5 6 3 4 2 1
----- --------------- ----------- --------- - - - - - -
```

```
   5              0.111      57.500      57.500  \
   6              0.319      69.175      69.175  . \
   3              0.0127     73.425      73.425  . . \
   4              0.0376     80.225      80.225  . . . \
   2              0.00483    92.500      92.500  . . . . \
   1       neg control     100.000     100.000  * . . . . . \
---------------------------------------------------------------------
```

```
* = significant difference (p=0.05)           . = no significant difference
Table q value (0.05,6) =   2.936               SE =    4.926

Estimates of EC%
---------------------------------------------------------------------
Parameter   Estimate      95% Bounds       Std.Err.  Lower Bound
                        Lower     Upper                /Estimate
EC5          8.6E-05    5.8E-09       1.3      2.0    6.8E-05
EC10         0.00080    6.5E-07      0.99      1.5    0.00081
EC25         0.034      0.00094       1.2     0.75    0.028
EC50         2.1        0.036     1.3E+02     0.85    0.017

         Slope =    0.374  Std.Err. =    0.214


Goodness of fit: p =       0.24  based on DF=       3.0        18.
---------------------------------------------------------------------
7918GS : Ryegrass % survival, Day 21; lbs a.i./A
---------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
---------------------------------------------------------------------
    Dose      #Reps.    Obs.      Pred.     Obs.      Pred.    %Change
                        Mean      Mean     -Pred.    %Control

    0.00       4.00    100.      101.     -0.904     100.      0.00
  0.00483      4.00     92.5      84.6     7.86       83.9     16.1
   0.0127      4.00     73.4      80.5    -7.04       79.7     20.3
   0.0376      4.00     80.2      75.1     5.14       74.4     25.6
    0.111      4.00     57.5      69.1    -11.6       68.4     31.6
    0.319      4.00     69.2      62.7     6.50       62.1     37.9
```

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

```
Wheat plant height (cm), Day 21; lbs a.i./A
File: 7918wh          Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls          Ho:GRP1 MEAN = GRP2 MEAN
---------------------------------------------------------------------
 GRP1 (SOLVENT CRTL) MEAN =      38.7750     CALCULATED t VALUE =     -5.9140
 GRP2 (BLANK CRTL) MEAN   =      41.0750     DEGREES OF FREEDOM =      6
 DIFFERENCE IN MEANS      =      -2.3000
---------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 6) =   2.447**   SIGNIFICANT DIFFERENCE at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =   3.707**   SIGNIFICANT DIFFERENCE at alpha=0.01

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7918wh          Transform: NO TRANSFORMATION
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
Chi-square test for normality: actual and expected frequencies
------------------------------------------------------------------------

INTERVAL      <-1.5      -1.5 to <-0.5    -0.5 to 0.5    >0.5 to 1.5    >1.5
              ____       _____     _____    _____    ____

EXPECTED      1.608      5.808            9.168          5.808          1.608
OBSERVED      0          7                9              8              0

------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =  4.2910
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Wheat plant height (cm), Day 21; lbs a.i./A
File: 7918wh       Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
------------------------------------------------------------------------

D =    76.115

W =     0.925

Critical W (P = 0.05) (n = 24) = 0.916
Critical W (P = 0.01) (n = 24) = 0.884
------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Wheat plant height (cm), Day 21; lbs a.i./A
File: 7918wh       Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
------------------------------------------------------------------------

Calculated H statistic (max Var/min Var) =   93.49
Closest, conservative, Table H statistic = 184.0   (alpha = 0.01)

Used for Table H ==>    R (# groups) =   6,   df (# reps-1) =        3
Actual values    ==>    R (# groups) =   6,   df (# avg reps-1) =  3.00


------------------------------------------------------------------------

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).



Wheat plant height (cm), Day 21; lbs a.i./A
File: 7918wh       Transform: NO TRANSFORMATION
```

```
Bartletts test for homogeneity of variance
-------------------------------------------------------------------------------

Calculated B statistic =    11.45
Table Chi-square value =    15.09   (alpha = 0.01)
Table Chi-square value =    11.07   (alpha = 0.05)

Average df used in calculation  ==>   df (avg n - 1) =   3.00
Used for Chi-square table value ==>   df (#groups-1) =   5
-------------------------------------------------------------------------------

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7918wh        Transform: NO TRANSFORM

                          ANOVA TABLE
-------------------------------------------------------------------------------

SOURCE              DF            SS            MS            F
-------------------------------------------------------------------------------

Between              5           62.510        12.502        2.956

Within (Error)      18           76.115         4.229
-------------------------------------------------------------------------------

Total               23          138.625
-------------------------------------------------------------------------------

  Critical F value =   2.77  (0.05,5,18)
  Since  F > Critical F  REJECT  Ho:All groups equal




Wheat plant height (cm), Day 21; lbs a.i./A
File: 7918wh        Transform: NO TRANSFORM

     DUNNETTS TEST    -    TABLE 1 OF 2              Ho:Control<Treatment
-------------------------------------------------------------------------------

                           TRANSFORMED   MEAN CALCULATED IN
GROUP     IDENTIFICATION       MEAN      ORIGINAL UNITS    T STAT  SIG
-----  -------------------  -----------  ------------------ ------  ---
  1         neg control       38.775          38.775
  2            0.00483        40.100          40.100        -0.911
  3            0.0127         41.275          41.275        -1.719
  4            0.0376         40.950          40.950        -1.496
  5            0.111          41.100          41.100        -1.599
  6            0.319          36.750          36.750         1.393
-------------------------------------------------------------------------------
Dunnett table value =   2.41      (1 Tailed Value, P=0.05,  df=18,5)




Wheat plant height (cm), Day 21; lbs a.i./A
File: 7918wh        Transform: NO TRANSFORM

     DUNNETTS TEST    -    TABLE 2 OF 2              Ho:Control<Treatment
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
                               NUM OF    Minimum Sig Diff   % of      DIFFERENCE
GROUP       IDENTIFICATION     REPS      (IN ORIG. UNITS)   CONTROL   FROM CONTROL
------      --------------     ------    ----------------   -------   ------------
  1          neg control         4
  2               0.00483        4            3.504            9.0        -1.325
  3               0.0127         4            3.504            9.0        -2.500
  4               0.0376         4            3.504            9.0        -2.175
  5               0.111          4            3.504            9.0        -2.325
  6               0.319          4            3.504            9.0         2.025
```

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7918wh   Transform: NO TRANSFORM

```
        WILLIAMS TEST   (Isotonic regression model)     TABLE 1 OF 2
-----------------------------------------------------------------------------
GROUP                                 ORIGINAL     TRANSFORMED    ISOTONIZED
            IDENTIFICATION      N      MEAN          MEAN           MEAN
------      --------------     ---    --------     -----------    ----------
  1          neg control        4      38.775        38.775         40.440
  2               0.00483       4      40.100        40.100         40.440
  3               0.0127        4      41.275        41.275         40.440
  4               0.0376        4      40.950        40.950         40.440
  5               0.111         4      41.100        41.100         40.440
  6               0.319         4      36.750        36.750         36.750
```

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7918wh   Transform: NO TRANSFORM

```
        WILLIAMS TEST   (Isotonic regression model)     TABLE 2 OF 2
-----------------------------------------------------------------------------
                 ISOTONIZED   CALC.      SIG       TABLE        DEGREES OF
   IDENTIFICATION    MEAN     WILLIAMS   P=.05     WILLIAMS     FREEDOM
   --------------   --------  --------   -----     --------     ----------
    neg control     40.440
         0.00483    40.440    1.145                1.73         k= 1, v=18
         0.0127     40.440    1.145                1.82         k= 2, v=18
         0.0376     40.440    1.145                1.85         k= 3, v=18
         0.111      40.440    1.145                1.86         k= 4, v=18
         0.319      36.750    1.393                1.87         k= 5, v=18
-----------------------------------------------------------------------------
s =   2.056
Note: df used for table values are approximate when v > 20.
```

Bean plant height (cm), Day 21; lbs a.i./A
File: 7918bh   Transform: NO TRANSFORM

```
        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
-----------------------------------------------------------------------------
 GRP1 (SOLVENT CRTL) MEAN  =     44.6500     CALCULATED t VALUE =     0.5374
 GRP2 (BLANK CRTL) MEAN    =     40.0000     DEGREES OF FREEDOM  =     6
 DIFFERENCE IN MEANS       =      4.6500
-----------------------------------------------------------------------------
```

```
TABLE t VALUE (0.05 (2), 6) =  2.447   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =  3.707   NO significant difference at alpha=0.01

Bean plant height (cm), Day 21; lbs a.i./A
File: 7918bh        Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
-------------------------------------------------------------------------------

INTERVAL      <-1.5     -1.5 to <-0.5    -0.5 to 0.5    >0.5 to 1.5    >1.5
              _____     _____    _____    _____    ____

EXPECTED      1.608       5.808            9.168'         5.808       1.608
OBSERVED      0           9                9              6           0

-------------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =   4.9797
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.




Bean plant height (cm), Day 21; lbs a.i./A
File: 7918bh        Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
-------------------------------------------------------------------------------

D = 2274.140

W =    0.953

Critical W (P = 0.05) (n = 24) = 0.916
Critical W (P = 0.01) (n = 24) = 0.884.
-------------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.




Bean plant height (cm), Day 21; lbs a.i./A
File: 7918bh         Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
-------------------------------------------------------------------------------

Calculated H statistic (max Var/min Var) =   10.43
Closest, conservative, Table H statistic =  184.0  (alpha = 0.01)

Used for Table H ==>    R (# groups) =   6,    df (# reps-1) =       3
Actual values   ==>    R (# groups) =   6,    df (# avg reps-1) =  3.00


-------------------------------------------------------------------------------

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).
```

```
Bean plant height (cm), Day 21; lbs a.i./A
File: 7918bh        Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance
-----------------------------------------------------------------------------

Calculated B statistic =    4.28
Table Chi-square value =   15.09   (alpha = 0.01)
Table Chi-square value =   11.07   (alpha = 0.05)

Average df used in calculation  ==>   df (avg n - 1) =   3.00
Used for Chi-square table value ==>   df (#groups-1) =   5
-----------------------------------------------------------------------------

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Bean plant height (cm), Day 21; lbs a.i./A
File: 7918bh        Transform: NO TRANSFORMATION

                            ANOVA TABLE
-----------------------------------------------------------------------------

SOURCE              DF            SS               MS              F
-----------------------------------------------------------------------------

Between             5           109.553         21.911          0.173

Within (Error)     18          2274.140        126.341
-----------------------------------------------------------------------------

Total              23          2383.693
-----------------------------------------------------------------------------

  Critical F value =   2.77   (0.05,5,18)
  Since  F < Critical F   FAIL TO REJECT  Ho:All groups equal



Bean plant height (cm), Day 21; lbs a.i./A
File: 7918bh        Transform: NO TRANSFORMATION

      DUNNETTS TEST    -    TABLE 1 OF 2          Ho:Control<Treatment
---------------------------------------------------------------------
                          TRANSFORMED   MEAN CALCULATED IN
GROUP     IDENTIFICATION     MEAN        ORIGINAL UNITS    T STAT  SIG
-----  --------------------  ----------  ------------------  ------  ---
  1         neg control      44.650          44.650
  2            0.00483       44.500          44.500          0.019
  3            0.0127        40.025          40.025          0.582
  4            0.0376        46.675          46.675         -0.255
  5            0.111         42.825          42.825          0.230
  6            0.319         41.925          41.925          0.343
---------------------------------------------------------------------
Dunnett table value =  2.41     (1 Tailed Value, P=0.05,  df=18,5)
```

```
Bean plant height (cm), Day 21; lbs a.i./A
File: 7918bh          Transform: NO TRANSFORMATION

        DUNNETTS TEST    -   TABLE 2 OF 2          Ho:Control<Treatment
----------------------------------------------------------------------------
                          NUM OF   Minimum Sig Diff  % of     DIFFERENCE
GROUP    IDENTIFICATION   REPS     (IN ORIG. UNITS)  CONTROL  FROM CONTROL
-----  ----------------   ------   ----------------  -------  ------------
   1        neg control    4
   2            0.00483    4          19.155          42.9        0.150
   3            0.0127     4          19.155          42.9        4.625
   4            0.0376     4          19.155          42.9       -2.025
   5            0.111      4          19.155          42.9        1.825
   6            0.319      4          19.155          42.9        2.725
----------------------------------------------------------------------------
```

```
Bean plant height (cm), Day 21; lbs a.i./A
File: 7918bh          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
----------------------------------------------------------------------------
GROUP                                ORIGINAL    TRANSFORMED    ISOTONIZED
         IDENTIFICATION    N         MEAN        MEAN           MEAN
------   -----------------  ---  -----------  -----------  -----------
   1        neg control    4       44.650        44.650       44.650
   2            0.00483    4       44.500        44.500       44.500
   3            0.0127     4       40.025        40.025       43.350
   4            0.0376     4       46.675        46.675       43.350
   5            0.111      4       42.825        42.825       42.825
   6            0.319      4       41.925        41.925       41.925
----------------------------------------------------------------------------
```

```
Bean plant height (cm), Day 21; lbs a.i./A
File: 7918bh          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
----------------------------------------------------------------------------
                 ISOTONIZED  CALC.      SIG      TABLE       DEGREES OF
     IDENTIFICATION  MEAN    WILLIAMS   P=.05    WILLIAMS    FREEDOM
------------------  -----  --------- -----  ----------- -------------
     neg control    44.650
         0.00483    44.500   0.019                1.73        k= 1, v=18
         0.0127     43.350   0.164                1.82        k= 2, v=18
         0.0376     43.350   0.164                1.85        k= 3, v=18
         0.111      42.825   0.230                1.86        k= 4, v=18
         0.319      41.925   0.343                1.87        k= 5, v=18
----------------------------------------------------------------------------
s =   11.240
Note: df used for table values are approximate when v > 20.

Estimates of EC%
----------------------------------------------------------------------------
Parameter   Estimate     95% Bounds            Std.Err.   Lower Bound
                       Lower       Upper                  /Estimate
EC5            0.53   9.2E-16    3.1E+14          7.1     1.7E-15
```

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
EC10            20.   1.4E-28   2.9E+30       14.   7.1E-30
EC25        8.9E+03   2.0E-60   4.0E+67       31.   2.2E-64
EC50        7.6E+06   1.5E-97   4.0E+110      50.   1.9E-104

        Slope =    0.230  Std.Err. =    1.53


Goodness of fit: p =       0.85  based on DF=       3.0        18.
------------------------------------------------------------------------
7918BH : Bean plant height (cm), Day 21; lbs a.i./A
------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
------------------------------------------------------------------------
    Dose      #Reps.     Obs.      Pred.      Obs.      Pred.   %Change
                        Mean      Mean     -Pred.   %Control

    0.00       4.00     44.6      44.5      0.118     100.      0.00
 0.00483       4.00     44.5      43.8      0.737      98.3     1.73
  0.0127       4.00     40.0      43.6     -3.54       97.8     2.18
  0.0376       4.00     46.7      43.3      3.40       97.2     2.81
   0.111       4.00     42.8      42.9     -0.111      96.4     3.59
   0.319       4.00     41.9      42.5     -0.604      95.5     4.50
```

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.

!!!Warning: EC25 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

Bean % survival, Day 21; lbs a.i./A
File: 7918bs   Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
----

```
INTERVAL     <-1.5      -1.5 to <-0.5    -0.5 to 0.5    >0.5 to 1.5    >1.5
             _____    _____      _____     _____     ____

EXPECTED     1.608        5.808            9.168          5.808        1.608
OBSERVED     0            9                7              8            0
```

Calculated Chi-Square goodness of fit test statistic =   6.3102
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Bean % survival, Day 21; lbs a.i./A
File: 7918bs   Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 3646.935

W =   0.957

```
Critical W (P = 0.05) (n = 24) = 0.916
Critical W (P = 0.01) (n = 24) = 0.884
-----------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Bean % survival, Day 21; lbs a.i./A
File: 7918bs        Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance
-----------------------------------------------------------------------------


These two tests can not be performed because at least one group has
zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.


-----------------------------------------------------------------------------


Bean % survival, Day 21; lbs a.i./A
File: 7918bs        Transform: NO TRANSFORMATION

            KRUSKAL-WALLIS ANOVA BY RANKS   -   TABLE 1 OF 2
--------------------------------------------------------------------
                            TRANSFORMED   MEAN CALCULATED IN    RANK
GROUP      IDENTIFICATION      MEAN        ORIGINAL UNITS        SUM
-----      --------------    ---------    -----------------   ---------
  1          neg control     100.000         100.000          76.000
  2             0.00483       88.900          88.900          55.000
  3             0.0127        93.650          93.650          62.000
  4             0.0376        86.125          86.125          52.500
  5             0.111         70.850          70.850          27.500
  6             0.319         67.025          67.025          27.000
--------------------------------------------------------------------


   Calculated H Value =  10.491      Critical H Value Table =  11.070
   Since  Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.



Bean % survival, Day 21; lbs a.i./A
File: 7918bs        Transform: NO TRANSFORMATION

 DUNNS MULTIPLE COMPARISON  -  KRUSKAL-WALLIS   -   TABLE 2 OF 2
--------------------------------------------------------------------
                                               GROUP
                    TRANSFORMED   ORIGINAL   0 0 0 0 0 0
GROUP  IDENTIFICATION   MEAN        MEAN     6 5 4 2 3 1
-----  --------------  ---------   --------  - - - - - -
  6            0.319     67.025     67.025   \
  5            0.111     70.850     70.850   . \
  4            0.0376    86.125     86.125   . . \
  2            0.00483   88.900     88.900   . . . \
  3            0.0127    93.650     93.650   . . . . \
  1        neg control  100.000    100.000  . . . . . \
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

```
* = significant difference (p=0.05)         . = no significant difference
Table q value (0.05,6) =   2.936            SE =   4.741

Estimates of EC%
-----------------------------------------------------------------------------
Parameter   Estimate    95% Bounds          Std.Err.  Lower Bound
                      Lower    Upper                   /Estimate
EC5          0.0033   2.7E-05    0.39          1.0     0.0084
EC10         0.013    0.00037    0.43          0.74    0.029
EC25         0.12     0.020      0.72          0.37    0.17
EC50         1.5      0.17       13.           0.45    0.12

        Slope =   0.620  Std.Err. =   0.296


Goodness of fit: p =      0.76  based on DF=       3.0        18.
-----------------------------------------------------------------------------
7918BS : Bean % survival, Day 21; lbs a.i./A
-----------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
-----------------------------------------------------------------------------
    Dose      #Reps.    Obs.     Pred.     Obs.      Pred.    %Change
                        Mean     Mean      -Pred.    %Control

    0.00      4.00      100.     99.5      0.521     100.      0.00
    0.00483   4.00      88.9     93.3      -4.43     93.8      6.18
    0.0127    4.00      93.6     89.5      4.16      90.0      10.0
    0.0376    4.00      86.1     83.4      2.75      83.8      16.2
    0.111     4.00      70.8     75.3      -4.42     75.7      24.3
    0.319     4.00      67.0     65.6      1.42      66.0      34.0

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.


Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7918ah        Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
-----------------------------------------------------------------------------
 GRP1 (SOLVENT CRTL) MEAN =    14.7500    CALCULATED t VALUE =    -1.0771
 GRP2 (BLANK CRTL) MEAN   =    15.4000    DEGREES OF FREEDOM =    6
 DIFFERENCE IN MEANS      =    -0.6500
-----------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 6) =  2.447   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =  3.707   NO significant difference at alpha=0.01

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7918ah        Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
-----------------------------------------------------------------------------


INTERVAL     <-1.5      -1.5 to <-0.5    -0.5 to 0.5    >0.5 to 1.5    >1.5


EXPECTED     1.608        5.808           9.168          5.808        1.608
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
OBSERVED        0            9              7          8         0

-----------------------------------------------------------------

Calculated Chi-Square goodness of fit test statistic =   6.3102
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7918ah       Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
-----------------------------------------------------------------

D =   80.836

W =    0.955

Critical W (P = 0.05) (n = 24) = 0.916
Critical W (P = 0.01) (n = 24) = 0.884
-----------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7918ah       Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
-----------------------------------------------------------------

Calculated H statistic (max Var/min Var) =   95.52
Closest, conservative, Table H statistic = 1705.0   (alpha = 0.01)

Used for Table H ==>    R (# groups) =   7,    df (# reps-1) =       2
Actual values    ==>    R (# groups) =   7,    df (# avg reps-1) =   2.43
                                              (average df used)


-----------------------------------------------------------------

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).



Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7918ah       Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance
-----------------------------------------------------------------

Calculated B statistic =   10.91
Table Chi-square value =   16.81   (alpha = 0.01)
Table Chi-square value =   12.59   (alpha = 0.05)
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
Average df used in calculation  ==>   df (avg n - 1) =   2.43
Used for Chi-square table value ==>   df (#groups-1) =   6
```

```
Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).
```

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7918ah   Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	77.844	12.974	2.728
Within (Error)	17	80.836	4.755	
Total	23	158.680		

```
  Critical F value =   2.70  (0.05,6,17)
  Since  F > Critical F  REJECT  Ho:All groups equal
```

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7918ah   Transform: NO TRANSFORMATION

```
     BONFERRONI T-TEST    -    TABLE 1 OF 2              Ho:Control<Treatment
```

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	14.750	14.750		
2	0.000629	15.100	15.100	-0.227	
3	0.00143	15.700	15.700	-0.616	
4	0.00392	15.075	15.075	-0.211	
5	0.0127	16.533	16.533	-1.071	
6	0.0321	13.667	13.667	0.650	
7	0.112	9.250	9.250	2.912	*

Bonferroni T table value = 2.65   (1 Tailed Value, P=0.05, df=17,6)

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7918ah   Transform: NO TRANSFORMATION

```
     BONFERRONI T-TEST    -    TABLE 2 OF 2              Ho:Control<Treatment
```

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	4			
2	0.000629	4	4.094	27.8	-0.350

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

3	0.00143	4	4.094	27.8	-0.950
4	0.00392	4	4.094	27.8	-0.325
5	0.0127	3	4.422	30.0	-1.783
6	0.0321	3	4.422	30.0	1.083
7	0.112	2	5.014	34.0	5.500

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7918ah   Transform: NO TRANSFORMATION

```
          WILLIAMS TEST  (Isotonic regression model)   TABLE 1 OF 2
```

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	14.750	14.750	15.374
2	0.000629	4	15.100	15.100	15.374
3	0.00143	4	15.700	15.700	15.374
4	0.00392	4	15.075	15.075	15.374
5	0.0127	3	16.533	16.533	15.374
6	0.0321	3	13.667	13.667	13.667
7	0.112	2	9.250	9.250	9.250

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7918ah   Transform: NO TRANSFORMATION

```
          WILLIAMS TEST  (Isotonic regression model)   TABLE 2 OF 2
```

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	15.374				
0.000629	15.374	0.404		1.74	k= 1, v=17
0.00143	15.374	0.404		1.82	k= 2, v=17
0.00392	15.374	0.404		1.85	k= 3, v=17
0.0127	15.374	0.374		1.87	k= 4, v=17
0.0321	13.667	0.650		1.87	k= 5, v=17
0.112	9.250	2.912	*	1.88	k= 6, v=17

s =   2.181
Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds Lower	Upper	Std.Err.	Lower Bound /Estimate
EC5	0.025	0.0056	0.11	0.31	0.23
EC10	0.037	0.012	0.11	0.23	0.33
EC25	0.071	0.040	0.12	0.12	0.57
EC50	0.15	0.082	0.26	0.12	0.56

```
        Slope =    2.14  Std.Err. =    1.04
```

Goodness of fit: p =   0.78 based on DF=   4.0   17.

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
7918AH : Cabbage plant height (cm), Day 21; lbs a.i./A
```

```
Observed vs. Predicted Treatment Group Means
```

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	14.8	15.3	-0.589	100.	0.00
0.000629	4.00	15.1	15.3	-0.239	100.	2.13e-05
0.00143	4.00	15.7	15.3	0.361	100.	0.000873
0.00392	4.00	15.1	15.3	-0.258	100.	0.0391
0.0127	3.00	16.5	15.2	1.37	98.8	1.16
0.0321	3.00	13.7	14.1	-0.453	92.1	7.95
0.112	2.00	9.25	9.18	0.0718	59.8	40.2

```
!!!Warning: EC50 not bracketed by doses evaluated.

Cabbage % survival, Day 21; lbs a.i./A
File: 7918as        Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls       Ho:GRP1 MEAN = GRP2 MEAN
```

```
 GRP1 (SOLVENT CRTL) MEAN =    100.0000    CALCULATED t VALUE =     1.0000
 GRP2 (BLANK CRTL) MEAN   =     97.5000    DEGREES OF FREEDOM =     6
 DIFFERENCE IN MEANS      =      2.5000
```

```
TABLE t VALUE (0.05 (2), 6) =  2.447    NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =  3.707    NO significant difference at alpha=0.01

Cabbage % survival, Day 21; lbs a.i./A
File: 7918as        Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
```

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	1.876	6.776	10.696	6.776	1.876
OBSERVED	0	6	16	6	0

```
Calculated Chi-Square goodness of fit test statistic =   6.5599
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Cabbage % survival, Day 21; lbs a.i./A
File: 7918as        Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
```

```
D = 2703.245

W =    0.948
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
Critical W (P = 0.05) (n = 28) = 0.924
Critical W (P = 0.01) (n = 28) = 0.896
```

```
Data PASS normality test at P=0.01 level. Continue analysis.
```


```
Cabbage % survival, Day 21; lbs a.i./A
File: 7918as      Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance
```

```
These two tests can not be performed because at least one group has
zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.
```

```
Cabbage % survival, Day 21; lbs a.i./A
File: 7918as      Transform: NO TRANSFORMATION
```

         KRUSKAL-WALLIS ANOVA BY RANKS   -   TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	98.000
2	0.000629	100.000	100.000	98.000
3	0.00143	78.750	78.750	73.500
4	0.00392	47.200	47.200	56.000
5	0.0127	27.500	27.500	38.000
6	0.0321	11.075	11.075	22.000
7	0.112	9.125	9.125	20.500

```
   Calculated H Value =  24.860       Critical H Value Table =  12.590
   Since  Calc H > Crit H  REJECT Ho:All groups are equal.
```


```
Cabbage % survival, Day 21; lbs a.i./A
File: 7918as      Transform: NO TRANSFORMATION
```

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP 0 7	0 6	0 5	0 4	0 3	0 2	0 1
7	0.112	9.125	9.125	\						
6	0.0321	11.075	11.075	.	\					
5	0.0127	27.500	27.500	.	.	\				
4	0.00392	47.200	47.200	.	.	.	\			
3	0.00143	78.750	78.750	.	.	.	.	\		
2	0.000629	100.000	100.000	*	*	.	.	.	\	

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
   1        neg control    100.000    100.000   * * . . . . . \
-----------------------------------------------------------------------------

* = significant difference (p=0.05)         . = no significant difference
Table q value (0.05,7) =   3.038            SE =    5.737

Estimates of EC%
----------------------------------------------------------------------------
Parameter   Estimate      95% Bounds        Std.Err.   Lower Bound
                        Lower      Upper                /Estimate
EC5            0.00014   2.0E-05   0.00093     0.41        0.15
EC10           0.00028   5.3E-05   0.0015      0.35        0.19
EC25           0.00097   0.00027   0.0035      0.27        0.27
EC50            0.0038   0.0015    0.0093      0.19        0.41

        Slope =    1.14  Std.Err. =    0.193


Goodness of fit: p =      0.34  based on DF=      4.0      21.
----------------------------------------------------------------------------
7918AS : Cabbage % survival, Day 21; lbs a.i./A
----------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
----------------------------------------------------------------------------
     Dose    #Reps.    Obs.     Pred.     Obs.     Pred.    %Change
                       Mean     Mean     -Pred.   %Control

     0.00     4.00    100.     108.     -8.02     100.      0.00
 0.000629     4.00    100.      87.8    12.2       81.3    18.7
  0.00143     4.00     78.8     74.0     4.74      68.5    31.5
  0.00392     4.00     47.2     53.3    -6.10      49.3    50.7
   0.0127     4.00     27.5     29.7    -2.21      27.5    72.5
   0.0321     4.00     11.1     15.7    -4.64      14.5    85.5
    0.112     4.00      9.13     5.09    4.04       4.71   95.3

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.


Lettuce plant height (cm), Day 21; lbs a.i./A
File: 7918lh        Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
----------------------------------------------------------------------------
 GRP1 (SOLVENT CRTL) MEAN =     9.1333     CALCULATED t VALUE =    -4.2301
 GRP2 (BLANK CRTL) MEAN   =    11.9000     DEGREES OF FREEDOM =      5
 DIFFERENCE IN MEANS      =    -2.7667
----------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 5) =  2.571**   SIGNIFICANT DIFFERENCE at alpha=0.05
TABLE t VALUE (0.01 (2), 5) =  4.032**   SIGNIFICANT DIFFERENCE at alpha=0.01

Lettuce plant height (cm), Day 21; lbs a.i./A
File: 7918lh        Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
----------------------------------------------------------------------------

INTERVAL     <-1.5     -1.5 to <-0.5     -0.5 to 0.5     >0.5 to 1.5     >1.5
             _____     _____             _____           _____           _____
```

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
EXPECTED      0.670         2.420         3.820         2.420        0.670
OBSERVED      0             3             4             3            0


--------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =   1.6265
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Lettuce plant height (cm), Day 21; lbs a.i./A
File: 79181h       Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
--------------------------------------------------------------------------

D =   18.194

W =    0.970

Critical W (P = 0.05) (n = 10) = 0.842
Critical W (P = 0.01) (n = 10) = 0.781
--------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Lettuce plant height (cm), Day 21; lbs a.i./A
File: 79181h       Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
--------------------------------------------------------------------------

Calculated H statistic (max Var/min Var) =   18.95
Closest, conservative, Table H statistic =  448.0  (alpha = 0.01)

Used for Table H ==>     R (# groups) =   3,     df (# reps-1) =      2.
Actual values    ==>     R (# groups) =   3,     df (# avg reps-1) =  2.33
                                                 (average df used)


--------------------------------------------------------------------------

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).



Lettuce plant height (cm), Day 21; lbs a.i./A
File: 79181h       Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance
--------------------------------------------------------------------------

Calculated B statistic =    3.25
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
Table Chi-square value =     9.21  (alpha = 0.01)
Table Chi-square value =     5.99  (alpha = 0.05)

Average df used in calculation  ==>   df (avg n - 1) =   2.33
Used for Chi-square table value ==>   df (#groups-1) =   2
-------------------------------------------------------------------

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Lettuce plant height (cm), Day 21; lbs a.i./A
File: 7918lh          Transform: NO TRANSFORMATION

                            ANOVA TABLE
-------------------------------------------------------------------

SOURCE            DF            SS              MS            F
-------------------------------------------------------------------

Between            2          2.815          1.407        0.541

Within (Error)     7         18.194          2.599

-------------------------------------------------------------------
Total              9         21.009
-------------------------------------------------------------------

   Critical F value =   4.74  (0.05,2,7)
   Since  F < Critical F  FAIL TO REJECT  Ho:All groups equal



Lettuce plant height (cm), Day 21; lbs a.i./A
File: 7918lh          Transform: NO TRANSFORMATION

      BONFERRONI T-TEST    -    TABLE 1 OF 2          Ho:Control<Treatment
---------------------------------------------------------------------
                        TRANSFORMED    MEAN CALCULATED IN
GROUP     IDENTIFICATION    MEAN          ORIGINAL UNITS    T STAT  SIG
-----  ----------------  ----------  ------------------  ------  ---
  1          neg control     9.133            9.133
  2            0.000629      9.175            9.175          -0.034
  3            0.00143       8.000            8.000           0.861
---------------------------------------------------------------------
Bonferroni T table value =  2.37     (1 Tailed Value, P=0.05,  df=7,2)



Lettuce plant height (cm), Day 21; lbs a.i./A
File: 7918lh          Transform: NO TRANSFORMATION

      BONFERRONI T-TEST    -    TABLE 2 OF 2          Ho:Control<Treatment
---------------------------------------------------------------------
                     NUM OF  Minimum Sig Diff  % of     DIFFERENCE
GROUP     IDENTIFICATION  REPS  (IN ORIG. UNITS)  CONTROL  FROM CONTROL
-----  ----------------  ------  ----------------  -------  ------------
  1          neg control    3
  2            0.000629     4          2.912        31.9       -0.042
  3            0.00143      3          3.113        34.1        1.133
---------------------------------------------------------------------
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
Lettuce plant height (cm), Day 21; lbs a.i./A
File: 79181h          Transform: NO TRANSFORMATION

         WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
-------------------------------------------------------------------------------
GROUP                                ORIGINAL    TRANSFORMED    ISOTONIZED
          IDENTIFICATION      N        MEAN        MEAN           MEAN
------  --------------------  ---   -----------  -----------   -----------
   1            neg control   3        9.133        9.133         9.157
   2               0.000629   4        9.175        9.175         9.157
   3                0.00143   3        8.000        8.000         8.000
-------------------------------------------------------------------------------




Lettuce plant height (cm), Day 21; lbs a.i./A
File: 79181h          Transform: NO TRANSFORMATION

         WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
-------------------------------------------------------------------------------
                   ISOTONIZED   CALC.     SIG     TABLE      DEGREES OF
          IDENTIFICATION   MEAN    WILLIAMS  P=.05   WILLIAMS     FREEDOM
-------------------  -----------  ---------- -----  ----------- -------------
          neg control    9.157
             0.000629    9.157     0.019             1.89       k= 1, v= 7
              0.00143    8.000     0.861             2.00       k= 2, v= 7
-------------------------------------------------------------------------------
s =    1.612
Note: df used for table values are approximate when v > 20.

Lettuce % survival, Day 21; lbs a.i./A
File: 79181s          Transform: NO TRANSFORM

         t-test of Solvent and Blank Controls       Ho:GRP1 MEAN = GRP2 MEAN
-------------------------------------------------------------------------------
  GRP1 (SOLVENT CRTL) MEAN =     95.2333    CALCULATED t VALUE =     0.1765
  GRP2 (BLANK CRTL) MEAN   =     93.7500    DEGREES OF FREEDOM =     5
  DIFFERENCE IN MEANS      =      1.4833
-------------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 5) =   2.571    NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 5) =   4.032    NO significant difference at alpha=0.01

Lettuce % survival, Day 21; lbs a.i./A
File: 79181s          Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
-------------------------------------------------------------------------------

INTERVAL     <-1.5      -1.5 to <-0.5    -0.5 to 0.5    >0.5 to 1.5    >1.5

             _____       _____        _____      _____     _____

EXPECTED     1.072         3.872            6.112          3.872       1.072
OBSERVED      0             7                3              6           0

-------------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =   7.4250
Table Chi-Square value (alpha = 0.01) = 13.277
```

Data PASS normality test. Continue analysis.

Lettuce % survival, Day 21; lbs a.i./A
File: 79181s   Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 5259.389

W =   0.897

Critical W (P = 0.05) (n = 16) = 0.887
Critical W (P = 0.01) (n = 16) = 0.844

Data PASS normality test at P=0.01 level. Continue analysis.

Lettuce % survival, Day 21; lbs a.i./A
File: 79181s   Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) =   25.02
Closest, conservative, Table H statistic = 1036.0   (alpha = 0.01)

Used for Table H ==>   R (# groups) =   5,   df (# reps-1) =   2
Actual values   ==>   R (# groups) = 5,   df (# avg reps-1) = 2.20
                                               (average df used)

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).

Lettuce % survival, Day 21; lbs a.i./A
File: 79181s   Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

Calculated B statistic =   6.80
Table Chi-square value =   13.28   (alpha = 0.01)
Table Chi-square value =   9.49   (alpha = 0.05)

Average df used in calculation ==>   df (avg n - 1) =   2.20
Used for Chi-square table value ==>   df (#groups-1) =   4

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Lettuce % survival, Day 21; lbs a.i./A
File: 79181s          Transform: NO TRANSFORMATION

                              ANOVA TABLE
------------------------------------------------------------------------------

SOURCE               DF              SS               MS               F
------------------------------------------------------------------------------

Between               4          14553.948        3638.487         7.610

Within (Error)       11           5259.389         478.126
------------------------------------------------------------------------------

Total                15          19813.337
------------------------------------------------------------------------------


   Critical F value =    3.36   (0.05,4,11)
   Since  F > Critical F  REJECT  Ho:All groups equal



Lettuce % survival, Day 21; lbs a.i./A
File: 79181s          Transform: NO TRANSFORMATION

      BONFERRONI T-TEST   -   TABLE 1 OF 2              Ho:Control<Treatment
------------------------------------------------------------------------------
                              TRANSFORMED   MEAN CALCULATED IN
GROUP     IDENTIFICATION         MEAN         ORIGINAL UNITS    T STAT  SIG
-----  --------------------   -----------   ------------------  ------  ---
  1          neg control        95.233           95.233
  2            0.000629         89.750           89.750          0.328
  3            0.00143          52.375           52.375          2.566
  4            0.00392          58.350           58.350          1.848
  5            0.0127           11.100           11.100          4.712   *
------------------------------------------------------------------------------
Bonferroni T table value =  2.59     (1 Tailed Value, P=0.05,  df=11,4)



Lettuce % survival, Day 21; lbs a.i./A
File: 79181s          Transform: NO TRANSFORMATION

      BONFERRONI T-TEST   -   TABLE 2 OF 2              Ho:Control<Treatment
------------------------------------------------------------------------------
                       NUM OF   Minimum Sig Diff  % of      DIFFERENCE
GROUP     IDENTIFICATION  REPS  (IN ORIG. UNITS)  CONTROL   FROM CONTROL
-----  --------------------  -------  ----------------  -------  ------------
  1          neg control     3
  2            0.000629      4            43.321        45.5        5.483
  3            0.00143       4            43.321        45.5       42.858
  4            0.00392       2            51.779        54.4       36.883
  5            0.0127        3            46.312        48.6       84.133
------------------------------------------------------------------------------
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
Lettuce % survival, Day 21; lbs a.i./A
File: 7918ls          Transform: NO TRANSFORMATION

          WILLIAMS TEST  (Isotonic regression model)    TABLE 1 OF 2
-------------------------------------------------------------------------
GROUP                                 ORIGINAL    TRANSFORMED    ISOTONIZED
          IDENTIFICATION     N         MEAN          MEAN          MEAN
-------   --------------    ---     ----------    -----------    ----------
   1         neg control    3         95.233        95.233        95.233
   2            0.000629    4         89.750        89.750        89.750
   3            0.00143     4         52.375        52.375        54.367
   4            0.00392     2         58.350        58.350        54.367
   5            0.0127      3         11.100        11.100        11.100
-------------------------------------------------------------------------



Lettuce % survival, Day 21; lbs a.i./A
File: 7918ls          Transform: NO TRANSFORMATION

          WILLIAMS TEST  (Isotonic regression model)    TABLE 2 OF 2
-------------------------------------------------------------------------
                    ISOTONIZED   CALC.      SIG      TABLE      DEGREES OF
     IDENTIFICATION    MEAN     WILLIAMS   P=.05    WILLIAMS     FREEDOM
-------------------  ---------- ---------- ------   ---------   ----------
        neg control    95.233
           0.000629    89.750     0.328               1.80      k= 1, v=11
           0.00143     54.367     2.447       *       1.89      k= 2, v=11
           0.00392     54.367     2.047       *       1.92      k= 3, v=11
           0.0127      11.100     4.712       *       1.94      k= 4, v=11
-------------------------------------------------------------------------
s =   21.866
Note: df used for table values are approximate when v > 20.

Estimates of EC%
-------------------------------------------------------------------------
Parameter   Estimate      95% Bounds          Std.Err.  Lower Bound
                        Lower     Upper                 /Estimate
EC5         0.00030   2.0E-05    0.0044        0.54      0.068
EC10        0.00050   4.8E-05    0.0051        0.47      0.098
EC25        0.0012    0.00020    0.0065        0.35      0.18
EC50        0.0029    0.00092    0.0095        0.23      0.31

        Slope =    1.66  Std.Err. =    0.601


Goodness of fit: p =      0.26  based on DF=      2.0        11.
-------------------------------------------------------------------------
7918LS : Lettuce % survival, Day 21; lbs a.i./A
-------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
-------------------------------------------------------------------------
    Dose      #Reps.      Obs.     Pred.     Obs.     Pred.     %Change
                          Mean     Mean     -Pred.   %Control

    0.00       3.00       95.2      95.4    -0.128    100.      0.00
 0.000629      4.00       89.8      82.7     7.10     86.7     13.3
 0.00143       4.00       52.4      66.6    -14.2     69.9     30.1
 0.00392       2.00       58.4      39.9     18.4     41.9     58.1
 0.0127        3.00       11.1      14.0    -2.88     14.7     85.3
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7918oh        Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
------------------------------------------------------------------------------
  GRP1 (SOLVENT CRTL) MEAN =    20.3000    CALCULATED t VALUE =   -1.2376
  GRP2 (BLANK CRTL) MEAN   =    21.2750    DEGREES OF FREEDOM =   6
  DIFFERENCE IN MEANS      =   -0.9750
------------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 6) = 2.447    NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) = 3.707    NO significant difference at alpha=0.01

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7918oh        Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
------------------------------------------------------------------------------

INTERVAL     <-1.5      -1.5 to <-0.5    -0.5 to 0.5    >0.5 to 1.5    >1.5
            _____       _____       _____      _____     _____

EXPECTED    0.938         3.388            5.348          3.388        0.938
OBSERVED    0             5                5              4            0


------------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =   2.7762
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.




Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7918oh        Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
------------------------------------------------------------------------------

D =   394.400

W =     0.912

Critical W (P = 0.05) (n = 14) = 0.874
Critical W (P = 0.01) (n = 14) = 0.825
------------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.




Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7918oh        Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
------------------------------------------------------------------------------
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   EPA MRID Number: 47127918

```
Calculated H statistic (max Var/min Var) =  103.66
Closest, conservative, Table H statistic =  120.0   (alpha = 0.01)

Used for Table H ==>     R (# groups) =   4,     df (# reps-1) =        3
Actual values    ==>     R (# groups) =   4,     df (# avg reps-1) =  2.50
                                                 (average df used)

------------------------------------------------------------------------


Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).



Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7918oh      Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance
------------------------------------------------------------------------


Calculated B statistic =    10.50
Table Chi-square value =    11.34   (alpha = 0.01)
Table Chi-square value =     7.81   (alpha = 0.05)

Average df used in calculation  ==>   df (avg n - 1) =    2.50
Used for Chi-square table value ==>   df (#groups-1) =    3
------------------------------------------------------------------------


Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7918oh      Transform: NO TRANSFORMATION

                         ANOVA TABLE
------------------------------------------------------------------------


SOURCE             DF            SS              MS              F
------------------------------------------------------------------------

Between             3          199.784         66.595          1.689

Within (Error)     10          394.400         39.440
------------------------------------------------------------------------

Total              13          594.184
------------------------------------------------------------------------


  Critical F value =   3.71   (0.05,3,10)
  Since  F < Critical F  FAIL TO REJECT  Ho:All groups equal



Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7918oh      Transform: NO TRANSFORMATION
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
            BONFERRONI T-TEST    -    TABLE 1 OF 2              Ho:Control<Treatment
-------------------------------------------------------------------------------
                                TRANSFORMED   MEAN CALCULATED IN
GROUP     IDENTIFICATION           MEAN        ORIGINAL UNITS    T STAT  SIG
-----  --------------------     -----------   -----------------  ------  ---
  1            neg control       20.300           20.300
  2               0.00143        21.625           21.625        -0.298
  3               0.00392        25.725           25.725        -1.222
  4                0.0127        13.650           13.650         1.223
-------------------------------------------------------------------------------
Bonferroni T table value =  2.41      (1 Tailed Value, P=0.05,  df=10,3)
```

```
Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7918oh          Transform: NO TRANSFORMATION


            BONFERRONI T-TEST    -    TABLE 2 OF 2              Ho:Control<Treatment
-------------------------------------------------------------------------------
                          NUM OF   Minimum Sig Diff  % of      DIFFERENCE
GROUP     IDENTIFICATION  REPS     (IN ORIG. UNITS)  CONTROL   FROM CONTROL
-----  --------------------  ------  ----------------  -------  ------------
  1            neg control    4
  2               0.00143     4          10.684        52.6       -1.325
  3               0.00392     4          10.684        52.6       -5.425
  4                0.0127     2          13.086        64.5        6.650
-------------------------------------------------------------------------------
```

```
Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7918oh          Transform: NO TRANSFORMATION


            WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
-------------------------------------------------------------------------------
GROUP                              ORIGINAL    TRANSFORMED    ISOTONIZED
          IDENTIFICATION     N      MEAN          MEAN          MEAN
------  --------------------  ---  ----------  -----------   -----------
  1            neg control    4     20.300       20.300         22.550
  2               0.00143     4     21.625       21.625         22.550
  3               0.00392     4     25.725       25.725         22.550
  4                0.0127     2     13.650       13.650         13.650
-------------------------------------------------------------------------------
```

```
Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7918oh          Transform: NO TRANSFORMATION


            WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
-------------------------------------------------------------------------------
                   ISOTONIZED   CALC.     SIG      TABLE      DEGREES OF
          IDENTIFICATION   MEAN    WILLIAMS  P=.05   WILLIAMS    FREEDOM
-------------------------  ----------  --------  -----  ----------  ------------
          neg control      22.550
             0.00143       22.550      0.507              1.81      k= 1, v=10
             0.00392       22.550      0.507              1.91      k= 2, v=10
              0.0127       13.650      1.223              1.94      k= 3, v=10
-------------------------------------------------------------------------------
s =    6.280
```

```
Note: df used for table values are approximate when v > 20.

Oilseed rape % survival, Day 21; lbs a.i./A
File: 7918os        Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
---------------------------------------------------------------------------
 GRP1 (SOLVENT CRTL) MEAN =    91.8750    CALCULATED t VALUE =    -1.0169
 GRP2 (BLANK CRTL) MEAN   =    97.5000    DEGREES OF FREEDOM =    6
 DIFFERENCE IN MEANS      =    -5.6250
---------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 6) = 2.447    NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) = 3.707    NO significant difference at alpha=0.01

Oilseed rape % survival, Day 21; lbs a.i./A
File: 7918os        Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
---------------------------------------------------------------------------

INTERVAL      <-1.5      -1.5 to <-0.5   -0.5 to 0.5   >0.5 to 1.5   >1.5
              _____      _____    _____   _____   ____

EXPECTED      1.608         5.808          9.168         5.808      1.608
OBSERVED      0             5              11            8          0

---------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =   4.5218
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Oilseed rape % survival, Day 21; lbs a.i./A
File: 7918os        Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
---------------------------------------------------------------------------

D = 3056.400

W =    0.961

Critical W (P = 0.05) (n = 24) = 0.916
Critical W (P = 0.01) (n = 24) = 0.884
---------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Oilseed rape % survival, Day 21; lbs a.i./A
File: 7918os         Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
---------------------------------------------------------------------------

Calculated H statistic (max Var/min Var) =    6.12
Closest, conservative, Table H statistic =  184.0   (alpha = 0.01)
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
Used for Table H ==>    R (# groups) =   6,    df (# reps-1) =         3
Actual values     ==>    R (# groups) =   6,    df (# avg reps-1) =  3.00


-----------------------------------------------------------------------------


Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).




Oilseed rape % survival, Day 21; lbs a.i./A
File: 7918os        Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance
-----------------------------------------------------------------------------


Calculated B statistic =    2.96
Table Chi-square value =   15.09   (alpha = 0.01)
Table Chi-square value =   11.07   (alpha = 0.05)

Average df used in calculation  ==>   df (avg n - 1) =   3.00
Used for Chi-square table value ==>   df (#groups-1) =   5
-----------------------------------------------------------------------------

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Oilseed rape % survival, Day 21; lbs a.i./A
File: 7918os        Transform: NO TRANSFORMATION

                        ANOVA TABLE
-----------------------------------------------------------------------------

SOURCE          DF              SS                MS              F
-----------------------------------------------------------------------------

Between          5          30365.418          6073.084        35.766

Within (Error)  18           3056.400           169.800
-----------------------------------------------------------------------------

Total           23          33421.818
-----------------------------------------------------------------------------

  Critical F value =   2.77  (0.05,5,18)
  Since  F > Critical F   REJECT  Ho:All groups equal




Oilseed rape % survival, Day 21; lbs a.i./A
File: 7918os        Transform: NO TRANSFORMATION

     DUNNETTS TEST    -   TABLE 1 OF 2           Ho:Control<Treatment
-----------------------------------------------------------------------------
                        TRANSFORMED     MEAN CALCULATED IN
GROUP     IDENTIFICATION      MEAN          ORIGINAL UNITS    T STAT  SIG
```

```
-----  -------------------       -----------      --------------------    -------  ---
  1            neg control       91.875                   91.875
  2               0.00143        79.375                   79.375            1.357
  3               0.00392        31.875                   31.875            6.512   *
  4                0.0127        12.150                   12.150           .8.652   *
  5                0.0321         5.000                    5.000            9.428   *
  6                0.112          3.575                    3.575            9.583   *
-------------------------------------------------------------------------------------
Dunnett table value =  2.41      (1 Tailed Value, P=0.05,  df=18,5)
```

```
Oilseed rape % survival, Day 21; lbs a.i./A
File: 7918os        Transform: NO TRANSFORMATION

        DUNNETTS TEST   -   TABLE 2 OF 2          Ho:Control<Treatment
----------------------------------------------------------------------------
                          NUM·OF  Minimum Sig Diff  % of    · DIFFERENCE
GROUP     IDENTIFICATION  REPS    (IN ORIG. UNITS)  CONTROL  FROM CONTROL
-----  -------------------  ----  ----------------  -------  ------------
  1            neg control   4
  2               0.00143    4          22.206       24.2       12.500
  3               0.00392    4          22.206       24.2       60.000
  4                0.0127    4          22.206       24.2       79.725
  5                0.0321    4          22.206       24.2       86.875
  6                0.112     4          22.206       24.2       88.300
----------------------------------------------------------------------------
```

```
Oilseed rape % survival, Day 21; lbs a.i./A
File: 7918os        Transform: NO TRANSFORMATION

        WILLIAMS TEST  (Isotonic regression model)    TABLE 1 OF 2
--------------------------------------------------------------------------
GROUP                              ORIGINAL    TRANSFORMED   ISOTONIZED
          IDENTIFICATION    N       MEAN          MEAN          MEAN
------  -------------------  ---  ----------  -----------  -----------
  1            neg control   4     91.875       91.875·       91.875
  2               0.00143    4     79.375       79.375        79.375
  3               0.00392    4     31.875       31.875        31.875
  4                0.0127    4     12.150       12.150        12.150
  5                0.0321    4      5.000        5.000         5.000
  6                0.112     4      3.575        3.575         3.575
--------------------------------------------------------------------------
```

```
Oilseed rape % survival, Day 21; lbs a.i./A
File: 7918os        Transform: NO TRANSFORMATION

        WILLIAMS TEST  (Isotonic regression model)    TABLE 2 OF 2
----------------------------------------------------------------------------
                ISOTONIZED  CALC.     SIG    TABLE       DEGREES OF
   IDENTIFICATION   MEAN    WILLIAMS  P=.05  WILLIAMS    FREEDOM
----------------  ----------  --------  -----  ----------  ------------
    neg control   91.875
       0.00143    79.375     1.357                1.73     k= 1, v=18
       0.00392    31.875     6.512       *        1.82     k= 2, v=18
        0.0127    12.150     8.652       *        1.85     k= 3, v=18
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203
EPA MRID Number: 47127918

```
                0.0321      5.000       9.428       *       1.86     k= 4, v=18
                0.112       3.575       9.583       *       1.87     k= 5, v=18
-----------------------------------------------------------------------------
s =    13.031
Note: df used for table values are approximate when v > 20.

Estimates of EC%
-----------------------------------------------------------------------------
Parameter   Estimate      95% Bounds         Std.Err.   Lower Bound
                        Lower     Upper                  /Estimate
EC5         0.00018    1.4E-05   0.0021        0.52       0.082
EC10        0.00032    3.6E-05   0.0029        0.46       0.11
EC25        0.00087    0.00016   0.0048        0.36       0.18
EC50        0.0026     0.00078   0.0088        0.25       0.30

        Slope =    1.40   Std.Err. =    0.366


Goodness of fit: p =      0.36  based on DF=       3.0        18.
-----------------------------------------------------------------------------
7918OS : Oilseed rape % survival, Day 21; lbs a.i./A
-----------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
-----------------------------------------------------------------------------
    Dose      #Reps.    Obs.      Pred.     Obs.     Pred.     %Change
                        Mean      Mean     -Pred.   %Control

      0.00      4.00     91.9      97.8     -5.90     100.      0.00
   0.00143      4.00     79.4      62.9     16.4      64.4     35.6
   0.00392      4.00     31.9      39.4     -7.53     40.3     59.7
    0.0127      4.00     12.2      16.4     -4.30     16.8     83.2
    0.0321      4.00     5.00      6.21     -1.21     6.35     93.6
    0.112       4.00     3.58      1.09     2.49      1.11     98.9

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.

!!!Warning: EC25 not bracketed by doses evaluated.

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7918sh        Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
-----------------------------------------------------------------------------
  GRP1 (SOLVENT CRTL) MEAN =     41.5250     CALCULATED t VALUE =     1.3598
  GRP2 (BLANK CRTL) MEAN   =     37.1750     DEGREES OF FREEDOM =     6
  DIFFERENCE IN MEANS      =     4.3500
-----------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 6) =  2.447   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =  3.707   NO significant difference at alpha=0.01

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7918sh        Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
-----------------------------------------------------------------------------

INTERVAL      <-1.5      -1.5 to <-0.5     -0.5 to 0.5    >0.5 to 1.5     >1.5
```

```
EXPECTED     1.608        5.808            9.168            5.808        1.608
OBSERVED     0            7                9                8            0
```

```
Calculated Chi-Square goodness of fit test statistic =   4.2910
Table Chi-Square value (alpha = 0.01) = 13.277
```

Data PASS normality test. Continue analysis.

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7918sh   Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 377.208

W =   0.975

Critical W (P = 0.05) (n = 24) = 0.916
Critical W (P = 0.01) (n = 24) = 0.884

Data PASS normality test at P=0.01 level. Continue analysis.

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7918sh   Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

```
Calculated H statistic (max Var/min Var) =    81.41
Closest, conservative, Table H statistic =   184.0  (alpha = 0.01)

Used for Table H ==>    R (# groups) =   6,    df (# reps-1) =      3
Actual values    ==>    R (# groups) =   6,    df (# avg reps-1) =  3.00
```

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7918sh   Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

```
Calculated B statistic =   13.25
Table Chi-square value =   15.09  (alpha = 0.01)
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

```
Table Chi-square value =   11.07  (alpha = 0.05)

Average df used in calculation  ==>   df (avg n - 1) =   3.00
Used for Chi-square table value ==>   df (#groups-1) =   5
-----------------------------------------------------------------------

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7918sh        Transform: NO TRANSFORMATION

                          ANOVA TABLE
-----------------------------------------------------------------------

SOURCE              DF              SS              MS              F
-----------------------------------------------------------------------

Between             5              427.102         85.420          4.076

Within (Error)     18              377.207         20.956
-----------------------------------------------------------------------
Total              23              804.310
-----------------------------------------------------------------------

  Critical F value =   2.77  (0.05,5,18)
  Since  F > Critical F  REJECT  Ho:All groups equal




Soybean plant height (cm), Day 21; lbs a.i./A
File: 7918sh        Transform: NO TRANSFORMATION

       DUNNETTS TEST   -   TABLE 1 OF 2        Ho:Control<Treatment
-----------------------------------------------------------------------
                       TRANSFORMED   MEAN CALCULATED IN
GROUP   IDENTIFICATION    MEAN       ORIGINAL UNITS     T STAT  SIG
-----   --------------  ----------   ------------------ ------  ---
  1        neg control   41.525          41.525
  2           0.00483    32.350          32.350          2.834   *
  3           0.0127     39.400          39.400          0.656
  4           0.0376     34.200          34.200          2.263
  5           0.111      34.200          34.200          2.263
  6           0.319      28.950          28.950          3.885   *
-----------------------------------------------------------------------
Dunnett table value =  2.41      (1 Tailed Value, P=0.05,  df=18,5)




Soybean plant height (cm), Day 21; lbs a.i./A
File: 7918sh        Transform: NO TRANSFORMATION

       DUNNETTS TEST   -   TABLE 2 OF 2        Ho:Control<Treatment
-----------------------------------------------------------------------
                      NUM OF  Minimum Sig Diff  % of     DIFFERENCE
GROUP   IDENTIFICATION REPS   (IN ORIG. UNITS)  CONTROL  FROM CONTROL
-----   -------------- ------ ----------------- -------  ------------
  1        neg control   4
  2           0.00483    4          7.801         18.8        9.175
```

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

3	0.0127	4	7.801	18.8	2.125
4	0.0376	4	7.801	18.8	7.325
5	0.111	4	7.801	18.8	7.325
6	0.319	4	7.801	18.8	12.575

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7918sh   Transform: NO TRANSFORMATION

            WILLIAMS TEST   (Isotonic regression model)   TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	41.525	41.525	41.525
2	0.00483	4	32.350	32.350	35.875
3	0.0127	4	39.400	39.400	35.875
4	0.0376	4	34.200	34.200	34.200
5	0.111	4	34.200	34.200	34.200
6	0.319	4	28.950	28.950	28.950

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7918sh   Transform: NO TRANSFORMATION

            WILLIAMS TEST   (Isotonic regression model)   TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	41.525				
0.00483	35.875	1.745	*	1.73	k= 1, v=18
0.0127	35.875	1.745		1.82	k= 2, v=18
0.0376	34.200	2.263	*	1.85	k= 3, v=18
0.111	34.200	2.263	*	1.86	k= 4, v=18
0.319	28.950	3.885	*	1.87	k= 5, v=18

s =   4.578
Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds Lower	Upper	Std.Err.	Lower Bound /Estimate
EC5	0.00028	4.9E-08	1.6	1.8	0.00018
EC10	0.0037	1.1E-05	1.2	1.2	0.0030
EC25	0.28	0.013	5.8	0.63	0.048
EC50	34.	0.037	3.0E+04	1.4	0.0011

        Slope =   0.323 Std.Err. =   0.188

Goodness of fit: p =   0.085 based on DF=   3.0   18.

7918SH : Soybean plant height (cm), Day 21; lbs a.i./A

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
Observed vs. Predicted Treatment Group Means
-------------------------------------------------------------------------

    Dose      #Reps.     Obs.     Pred.     Obs.     Pred.     %Change
                         Mean     Mean     -Pred.    %Control

    0.00       4.00      41.5     41.1     0.399     100.      0.00
  0.00483      4.00      32.3     36.7     -4.38      89.3     10.7
  0.0127       4.00      39.4     35.6      3.79      86.6     13.4
  0.0376       4.00      34.2     34.1     0.0606     83.0     17.0
  0.111        4.00      34.2     32.4      1.76       78.9     21.1
  0.319        4.00      28.9     30.6     -1.63       74.4     25.6
```

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

Soybean % survival, Day 21; lbs a.i./A
File: 7918ss   Transform: NO TRANSFORM

```
      t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
-------------------------------------------------------------------------

  GRP1 (SOLVENT CRTL) MEAN =    94.7250    CALCULATED t VALUE =    -1.7274
  GRP2 (BLANK CRTL) MEAN   =   100.0000    DEGREES OF FREEDOM =     6
  DIFFERENCE IN MEANS      =    -5.2750
-------------------------------------------------------------------------

TABLE t VALUE (0.05 (2), 6) =  2.447    NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =  3.707    NO significant difference at alpha=0.01
```

Soybean % survival, Day 21; lbs a.i./A
File: 7918ss   Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

```
-------------------------------------------------------------------------

INTERVAL     <-1.5     -1.5 to <-0.5     -0.5 to 0.5     >0.5 to 1.5     >1.5

             ____        _____          _____        _____      ____

EXPECTED     1.608        5.808            9.168           5.808         1.608
OBSERVED     0            7                12              5             0

-------------------------------------------------------------------------

Calculated Chi-Square goodness of fit test statistic =   4.4479
Table Chi-Square value (alpha = 0.01) = 13.277
```

Data PASS normality test. Continue analysis.

Soybean % survival, Day 21; lbs a.i./A
File: 7918ss   Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

```
-------------------------------------------------------------------------

D = 1929.465

W =    0.952
```

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
Critical W (P = 0.05) (n = 24) = 0.916
Critical W (P = 0.01) (n = 24) = 0.884
----------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Soybean % survival, Day 21; lbs a.i./A
File: 7918ss        Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance
----------------------------------------------------------------------------

These two tests can not be performed because at least one group has
zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.


----------------------------------------------------------------------------


Soybean % survival, Day 21; lbs a.i./A
File: 7918ss        Transform: NO TRANSFORMATION

            KRUSKAL-WALLIS ANOVA BY RANKS  -  TABLE 1 OF 2
----------------------------------------------------------------------------
                         TRANSFORMED   MEAN CALCULATED IN     RANK
GROUP     IDENTIFICATION    MEAN        ORIGINAL UNITS         SUM
----- ------------------ ----------- -------------------- ------------
  1          neg control    94.725           94.725          49.000
  2              0.00483    92.500           92.500          53.500
  3               0.0127   100.000          100.000          68.000
  4               0.0376    91.675           91.675          44.500
  5                0.111    97.500           97.500          59.500
  6                0.319    81.050           81.050          25.500
----------------------------------------------------------------------------

  Calculated H Value =   7.005        Critical H Value Table =  11.070
  Since  Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.



Soybean % survival, Day 21; lbs a.i./A
File: 7918ss        Transform: NO TRANSFORMATION

 DUNNS MULTIPLE COMPARISON -  KRUSKAL-WALLIS  -  TABLE 2 OF 2
----------------------------------------------------------------------------
                                           GROUP
                    TRANSFORMED  ORIGINAL  0 0 0 0 0 0
GROUP  IDENTIFICATION   MEAN       MEAN    6 4 2 1 5 3
----- -------------- ----------- --------- - - - - - -
  6             0.319    81.050    81.050  \
  4            0.0376    91.675    91.675  . \
  2           0.00483    92.500    92.500  . . \
  1       neg control    94.725    94.725  . . . \
  5             0.111    97.500    97.500  . . . . \
  3            0.0127   100.000   100.000  . . . . . \
----------------------------------------------------------------------------
```

```
* = significant difference (p=0.05)          . = no significant difference
Table q value (0.05,6) =   2.936          SE =   4.345


Tomato plant height (cm), Day 21; lbs a.i./A
File: 7918th        Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
-------------------------------------------------------------------------------
 GRP1 (SOLVENT CRTL) MEAN =    15.1250    CALCULATED t VALUE =    2.8719
 GRP2 (BLANK CRTL) MEAN   =    12.7750    DEGREES OF FREEDOM =    6
 DIFFERENCE IN MEANS      =     2.3500
-------------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 6) =  2.447**   SIGNIFICANT DIFFERENCE at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =  3.707   NO significant difference at alpha=0.01

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7918th        Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
-------------------------------------------------------------------------------

INTERVAL      <-1.5      -1.5 to <-0.5     -0.5 to 0.5    >0.5 to 1.5    >1.5
            _____      _____     _____    _____    _____

EXPECTED    1.005         3.630             5.730           3.630      1.005
OBSERVED    0             5                 5               5          0


-------------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =   3.1371
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Tomato plant height (cm), Day 21; lbs a.i./A
File: 7918th        Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
-------------------------------------------------------------------------------

D =   79.624

W =    0.985

Critical W (P = 0.05) (n = 15) = 0.881
Critical W (P = 0.01) (n = 15) = 0.835
-------------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Tomato plant height (cm), Day 21; lbs a.i./A
File: 7918th        Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
-------------------------------------------------------------------------------
```

```
Calculated H statistic (max Var/min Var) =    14.10
Closest, conservative, Table H statistic =   120.0   (alpha = 0.01)

Used for Table H ==>      R (# groups) =   4,     df (# reps-1) =          3
Actual values    ==>      R (# groups) =   4,     df (# avg reps-1) =   2.75
                                                  (average df used)


-----------------------------------------------------------------------------

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).



Tomato plant height (cm), Day 21; lbs a.i./A
File: 7918th        Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance
-----------------------------------------------------------------------------


Calculated B statistic =     5.90
Table Chi-square value =    11.34   (alpha = 0.01)
Table Chi-square value =     7.81   (alpha = 0.05)

Average df used in calculation  ==>   df (avg n - 1) =    2.75
Used for Chi-square table value ==>   df (#groups-1) =    3
-----------------------------------------------------------------------------

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7918th        Transform: NO TRANSFORMATION

                            ANOVA TABLE
-----------------------------------------------------------------------------

SOURCE              DF            SS                MS               F
-----------------------------------------------------------------------------

Between              3            88.373            29.458           4.069

Within (Error)      11            79.624             7.239
-----------------------------------------------------------------------------

Total               14           167.997
-----------------------------------------------------------------------------

  Critical F value =   3.59   (0.05,3,11)
  Since  F > Critical F  REJECT  Ho:All groups equal



Tomato plant height (cm), Day 21; lbs a.i./A
File: 7918th        Transform: NO TRANSFORMATION
```

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

```
        BONFERRONI T-TEST    -    TABLE 1 OF 2              Ho:Control<Treatment
-----------------------------------------------------------------------------------
                                 TRANSFORMED   MEAN CALCULATED IN
GROUP      IDENTIFICATION           MEAN        ORIGINAL UNITS     T STAT  SIG
-----  --------------------      -----------   ------------------  ------  ---
  1              neg control      15.125              15.125
  2                  0.00143      12.750              12.750        1.248
  3                  0.00392      10.700             10.700         2.326
  4                  0.0127        8.333              8.333         3.305   *
-----------------------------------------------------------------------------------
Bonferroni T table value =  2.43      (1 Tailed Value, P=0.05,  df=11,3)
```

```
Tomato plant height (cm), Day 21; lbs a.i./A
File: 7918th          Transform: NO TRANSFORMATION

        BONFERRONI T-TEST    -    TABLE 2 OF 2              Ho:Control<Treatment
-----------------------------------------------------------------------------------
                                 NUM OF   Minimum Sig Diff   % of     DIFFERENCE
GROUP      IDENTIFICATION        REPS    (IN ORIG. UNITS)  CONTROL   FROM CONTROL
-----  --------------------      -------  ----------------  -------   ------------
  1              neg control      4
  2                  0.00143      4             4.627        30.6         2.375
  3                  0.00392      4             4.627        30.6         4.425
  4                  0.0127       3             4.998        33.0         6.792
-----------------------------------------------------------------------------------
```

```
Tomato plant height (cm), Day 21; lbs a.i./A
File: 7918th          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
-----------------------------------------------------------------------------------
GROUP                                ORIGINAL      TRANSFORMED     ISOTONIZED
          IDENTIFICATION      N       MEAN           MEAN            MEAN
------  --------------------  ---   ----------    -----------     ----------
  1              neg control   4      15.125         15.125          15.125
  2                  0.00143   4      12.750         12.750          12.750
  3                  0.00392   4      10.700         10.700          10.700
  4                  0.0127    3       8.333          8.333           8.333
-----------------------------------------------------------------------------------
```

```
Tomato plant height (cm), Day 21; lbs a.i./A
File: 7918th          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
-----------------------------------------------------------------------------------
                     ISOTONIZED   CALC.      SIG      TABLE       DEGREES OF
     IDENTIFICATION     MEAN     WILLIAMS   P=.05    WILLIAMS       FREEDOM
------------------   ----------  ---------  -----   ----------   ------------
        neg control   15.125
            0.00143   12.750      1.248               1.80        k= 1, v=11
            0.00392   10.700      2.326       *       1.89        k= 2, v=11
            0.0127     8.333      3.305       *       1.92        k= 3, v=11
-----------------------------------------------------------------------------------
s =    2.690
```

Note: df used for table values are approximate when v > 20.

Estimates of EC%
```
---------------------------------------------------------------------------
Parameter    Estimate      95% Bounds         Std.Err.  Lower Bound
                         Lower     Upper                 /Estimate
EC5          0.00025    3.0E-06    0.021        0.88      0.012
EC10         0.00064    2.1E-05    0.019        0.68      0.034
EC25          0.0030    0.00047    0.020        0.37      0.15
EC50          0.017     0.0035     0.084        0.32      0.20

          Slope =   0.896  Std.Err. =    0.487
```

Goodness of fit: p =   0.89 based on DF=   1.0   11.
```
---------------------------------------------------------------------------
```
7918TH : Tomato plant height (cm), Day 21; lbs a.i./A
```
---------------------------------------------------------------------------
```
Observed vs. Predicted Treatment Group Means
```
---------------------------------------------------------------------------
```

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	15.1	15.1	-0.0230	100.	0.00
0.00143	4.00	12.8	12.6	0.133	83.3	16.7
0.00392	4.00	10.7	10.9	-0.157	71.7	28.3
0.0127	3.00	8.33	8.27	0.0629	54.6	45.4

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

Tomato % survival, Day 21; lbs a.i./A
File: 7918ts   Transform: NO TRANSFORM

```
      t-test of Solvent and Blank Controls          Ho:GRP1 MEAN = GRP2 MEAN
---------------------------------------------------------------------------
  GRP1 (SOLVENT CRTL) MEAN =    86.3250    CALCULATED t VALUE =    -1.0316
  GRP2 (BLANK CRTL) MEAN   =    93.0500    DEGREES OF FREEDOM =    6
  DIFFERENCE IN MEANS      =    -6.7250
---------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 6) =  2.447   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) =  3.707   NO significant difference at alpha=0.01
```

Tomato % survival, Day 21; lbs a.i./A
File: 7918ts   Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
```
---------------------------------------------------------------------------
```

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	1.072	3.872	6.112	3.872	1.072
OBSERVED	0	6	6	4	0

```
---------------------------------------------------------------------------
```
Calculated Chi-Square goodness of fit test statistic =   3.3198

```
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.



Tomato % survival, Day 21; lbs a.i./A
File: 7918ts        Transform: NO TRANSFORMATION

Shapiro Wilks test for normality
--------------------------------------------------------------------------

D = 3376.475

W =    0.988

Critical W (P = 0.05) (n = 16) = 0.887
Critical W (P = 0.01) (n = 16) = 0.844
--------------------------------------------------------------------------

Data PASS normality test at P=0.01 level. Continue analysis.



Tomato % survival, Day 21; lbs a.i./A
File: 7918ts        Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
--------------------------------------------------------------------------

Calculated H statistic (max Var/min Var) =    3.83
Closest, conservative, Table H statistic =  120.0  (alpha = 0.01)

Used for Table H ==>     R (# groups) =   4,    df (# reps-1) =       3
Actual values    ==>     R (# groups) =   4,    df (# avg reps-1) =  3.00


--------------------------------------------------------------------------

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, the Hartley test may still be used
      as an approximate test (average df are used).



Tomato % survival, Day 21; lbs a.i./A
File: 7918ts        Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance
--------------------------------------------------------------------------

Calculated B statistic =    1.28
Table Chi-square value =   11.34  (alpha = 0.01)
Table Chi-square value =    7.81  (alpha = 0.05)

Average df used in calculation  ==>  df (avg n - 1) =   3.00
Used for Chi-square table value ==>  df (#groups-1) =  3
--------------------------------------------------------------------------
```

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).

Tomato % survival, Day 21; lbs a.i./A
File: 7918ts   Transform: NO TRANSFORMATION

                             ANOVA TABLE

SOURCE   DF   SS   MS   F

Between   3   9119.075   3039.692   10.803

Within (Error)   12   3376.475   281.373

Total   15   12495.550

   Critical F value =   3.49 (0.05,3,12)
   Since F > Critical F REJECT Ho:All groups equal

Tomato % survival, Day 21; lbs a.i./A
File: 7918ts   Transform: NO TRANSFORMATION

        DUNNETTS TEST   -   TABLE 1 OF 2   Ho:Control<Treatment
----
                         TRANSFORMED   MEAN CALCULATED IN
GROUP   IDENTIFICATION   MEAN   ORIGINAL UNITS   T STAT   SIG
----
  1   neg control   86.325   86.325
  2   0.00143   65.975   65.975   1.716
  3   0.00392   53.650   53.650   2.755   *
  4   0.0127   20.550   20.550   5.545   *

Dunnett table value = 2.29   (1 Tailed Value, P=0.05, df=12,3)

Tomato % survival, Day 21; lbs a.i./A
File: 7918ts   Transform: NO TRANSFORMATION

        DUNNETTS TEST   -   TABLE 2 OF 2   Ho:Control<Treatment
----
                         NUM OF Minimum Sig Diff % of   DIFFERENCE
GROUP   IDENTIFICATION   REPS   (IN ORIG. UNITS) CONTROL   FROM CONTROL
----
  1   neg control   4
  2   0.00143   4   27.162   31.5   20.350
  3   0.00392   4   27.162   31.5   32.675
  4   0.0127   4   27.162   31.5   65.775

Tomato % survival, Day 21; lbs a.i./A
File: 7918ts   Transform: NO TRANSFORMATION

```
        WILLIAMS TEST  (Isotonic regression model)   TABLE 1 OF 2
-----------------------------------------------------------------------
GROUP                              ORIGINAL    TRANSFORMED    ISOTONIZED
         IDENTIFICATION     N        MEAN         MEAN          MEAN
------   ----------------  ---   ----------   -----------    ----------
   1          neg control   4      86.325        86.325        86.325
   2              0.00143    4      65.975        65.975        65.975
   3              0.00392    4      53.650        53.650        53.650
   4               0.0127    4      20.550        20.550        20.550
-----------------------------------------------------------------------



Tomato % survival, Day 21; lbs a.i./A
File: 7918ts          Transform: NO TRANSFORMATION

        WILLIAMS TEST  (Isotonic regression model)    TABLE 2 OF 2
-----------------------------------------------------------------------
                  ISOTONIZED   CALC.     SIG      TABLE     DEGREES OF
    IDENTIFICATION    MEAN     WILLIAMS  P=.05   WILLIAMS    FREEDOM
------------------- ---------- --------  -----  ---------- ------------
      neg control     86.325
          0.00143     65.975   1.716               1.78    k= 1, v=12
          0.00392     53.650   2.755      *        1.87    k= 2, v=12
           0.0127     20.550   5.545      *        1.90    k= 3, v=12
-----------------------------------------------------------------------
s =  16.774
Note: df used for table values are approximate when v > 20.

Estimates of EC%
-----------------------------------------------------------------------
Parameter  Estimate     95% Bounds         Std.Err.  Lower Bound
                      Lower     Upper                 /Estimate
EC5         0.00059   7.2E-05   0.0048       0.42       0.12
EC10        0.00096   0.00016   0.0056       0.36       0.17
EC25        0.0021    0.00062   0.0075       0.25       0.29
EC50        0.0053    0.0025    0.011        0.15       0.46

       Slope =    1.73  Std.Err. =   0.573


Goodness of fit: p =     0.53  based on DF=      1.0      12.
-----------------------------------------------------------------------
7918TS : Tomato % survival, Day 21; lbs a.i./A
-----------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
-----------------------------------------------------------------------
    Dose     #Reps.    Obs.     Pred.     Obs.     Pred.    %Change
                       Mean     Mean     -Pred.   %Control
    0.00      4.00     86.3     84.6      1.77     100.      0.00
 0.00143      4.00     66.0     70.7     -4.75     83.6     16.4
 0.00392      4.00     53.6     49.7      3.94     58.8     41.2
  0.0127      4.00     20.6     21.5     -0.954    25.4     74.6

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.
```

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

TOTAL DRY WEIGHT STATISTICS (g ai/ha)

```
IIA 8.12
MRID-47127918
PMRA-1547203
PMRA sub 2008-0431
BAS800 02H seed emerg
```

Total dry weight was calculated by multiplying the reported average dry weight per living plant and multiplying it by the number of survivors in that pot. Treatments groups were compared to the negative control groups only as per USEPA policy. Replicates with no survivors were not included in the analysis. Hypothesis testing was conducted with Dunnett's test except in cases where the assumptions of normality and equal variances were not met. In these cases, Bonferroni's t-test was used. Point estimates were derived using linear interpolation.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**
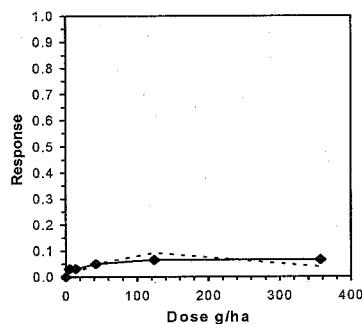
Corn

Terrestrial plants-Dry weight						
Start Date:			Test ID:	1547203	Sample ID:	BAS8002-12% saflufenacil
End Date:			Lab ID:	WI-Wildlife International	Sample Type:	EP-end-use product
Sample Date:			Protocol:	OECD208-Seedling emergen	Test Species:	CRSP-crop species
Comments:						

Conc-g/ha	1	2	3	4
egative control	12.700	13.700	13.600	12.600
djuvant control	12.510	12.420	10.900	12.000
5.41	11.100	14.000	13.800	11.280
14.2	11.840	13.300	13.600	13.000
42.1	11.600	14.700	12.600	11.070
124	12.100	12.960	9.870	12.800
357	10.800	11.900	13.300	14.600

			Transform: Untransformed					1-Tailed			Isotonic	
Conc-g/ha	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
egative control	13.150	1.0997	13.150	12.600	13.700	4.412	4	*			13.150	1.0000
djuvant control	11.958	1.0000	11.958	10.900	12.510	6.182	4					
5.41	12.545	1.0491	12.545	11.100	14.000	12.503	4	0.640	2.410	2.278	12.740	0.9688
14.2	12.935	1.0817	12.935	11.840	13.600	5.953	4	0.227	2.410	2.278	12.740	0.9688
42.1	12.493	1.0447	12.493	11.070	14.700	12.828	4	0.695	2.410	2.278	12.493	0.9500
124	11.933	0.9979	11.933	9.870	12.960	11.941	4	1.288	2.410	2.278	12.291	0.9347
357	12.650	1.0579	12.650	10.800	14.600	13.077	4	0.529	2.410	2.278	12.291	0.9347

| Auxiliary Tests		Statistic	Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.97402	0.916		0.00342	-0.8173
Bartlett's Test indicates equal variances (p = 0.54)		4.08417	15.0863			
The control means are significantly different (p = 0.04)		2.53796	2.44691			

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	357	>357			2.27834	0.17326	0.70042	1.78744	0.84792	5, 18
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)				
Point	g/ha	SD	95% CL(Exp)	Skew
IC05	42.100			
IC10	>357			
IC15	>357			
IC20	>357			
IC25	>357			
IC40	>357			
IC50	>357			

Dose-Response Plot

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

Ryegrass

Terrestrial plants-Dry weight						
Start Date:		Test ID:	1547203	Sample ID:	BAS8002-12% saflufenacil	
End Date:		Lab ID:	WI-Wildlife International	Sample Type:	EP-end-use product	
Sample Date:		Protocol:	OECD208-Seedling emergen	Test Species:	CRSP-crop species	
Comments:						

Conc-g/ha	1	2	3	4
egative control	0.1440	0.5800	0.2070	0.1890
djuvant control	0.3240	0.1540	0.2700	0.2520
5.41	.2340	0.2250	0.2790	0.1520
14.2	0.0950	0.1560	0.2310	0.1260
42.1	0.1190	0.0550	0.1620	0.1050
124	0.1200	0.0360	0.0520	0.1260
357	0.0800	0.0720	0.0840	0.1440

			Transform: Untransformed					1-Tailed			Isotonic	
Conc-g/ha	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
egative control	0.2800	1.1200	0.2800	0.1440	0.5800	72.053	4	*			0.2800	1.0000
djuvant control	0.2500	1.0000	0.2500	0.1540	0.3240	28.375	4					
5.41	0.2225	0.8900	0.2225	0.1520	0.2790	23.641	4	0.873	2.552	0.1681	0.2225	0.7946
14.2	0.1520	0.6080	0.1520	0.0950	0.2310	38.328	4	1.944	2.552	0.1681	0.1520	0.5429
*42.1	0.1103	0.4410	0.1103	0.0550	0.1620	40.001	4	2.578	2.552	0.1681	0.1103	0.3938
*124	0.0835	0.3340	0.0835	0.0360	0.1260	55.259	4	2.984	2.552	0.1681	0.0893	0.3188
*357	0.0950	0.3800	0.0950	0.0720	0.1440	34.785	4	2.810	2.552	0.1681	0.0893	0.3188

Auxiliary Tests			Statistic	Critical		Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)			0.83618	0.916		1.99562	7.17959
Bartlett's Test indicates equal variances (p = 0.01)			14.6207	15.0863			
The control means are not significantly different (p = 0.79)			0.28056	2.44691			

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	14.2	42.1	24.4504		0.16806	0.60023	0.0247	0.00867	0.04578	5, 18
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)				
Point	g/ha	SD	95% CL(Exp)	Skew
IC05*	1.317	3.950	0.006 26.419	1.7083
IC10*	2.634	4.733	0.013 30.118	1.6163
IC15*	3.952	5.616	0.019 34.488	1.5465
IC20*	5.269	6.637	0.025 39.792	1.5193
IC25	6.969	8.912	0.000 49.044	1.7382
IC40	12.205	22.079	0.000 129.447	2.0508
IC50	22.219			

* indicates IC estimate less than the lowest concentration

Dose-Response Plot

1-tail, 0.05 level of significance

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547203

EPA MRID Number: 47127918

`Wheat`

Terrestrial plants-Dry weight						
Start Date:			Test ID:	1547203	Sample ID:	BAS8002-12% saflufenacil
End Date:			Lab ID:	WI-Wildlife International	Sample Type:	EP-end-use product
Sample Date:			Protocol:	OECD208-Seedling emergen	Test Species:	CRSP-crop species
Comments:						

Conc-g/ha	1	2	3	4
egative control	1.6600	3.0900	1.8800	1.9100
djuvant control	1.6560	1.7800	1.7640	2.2200
5.41	1.8180	1.6080	1.5930	2.4700
14.2	1.5840	1.6800	1.6560	1.6400
42.1	1.7280	1.9500	1.8800	1.8130
124	1.9890	1.3410	1.3440	1.7730
357	1.1680	1.4900	1.0170	1.7040

			Transform: Untransformed					1-Tailed			Isotonic	
Conc-g/ha	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
egative control	2.1350	1.1509	2.1350	1.6600	3.0900	30.274	4	*			2.1350	1.0000
djuvant control	1.8550	1.0000	1.8550	1.6560	2.2200	13.449	4					
5.41	1.8723	1.0093	1.8723	1.5930	2.4700	21.980	4	1.019	2.552	0.6584	1.8723	0.8769
14.2	1.6400	0.8841	1.6400	1.5840	1.6800	2.487	4	1.919	2.552	0.6584	1.7414	0.8156
42.1	1.8428	0.9934	1.8428	1.7280	1.9500	5.143	4	1.133	2.552	0.6584	1.7414	0.8156
124	1.6118	0.8689	1.6118	1.3410	1.9890	20.051	4	2.028	2.552	0.6584	1.6118	0.7549
*357	1.3448	0.7249	1.3448	1.0170	1.7040	23.073	4	3.064	2.552	0.6584	1.3448	0.6299

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.90018	0.916	1.32115	2.23646
Bartlett's Test indicates unequal variances (p = 5.28E-03)	16.6213	15.0863		
The control means are not significantly different (p = 0.45)	0.80828	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	124	357	210.4		0.65839	0.30838	0.29339	0.13308	0.09893	5, 18
Treatments vs NEG-negative control										

			Linear Interpolation (200 Resamples)		
Point	g/ha	SD	95% CL(Exp)		Skew
IC05*	2.20	26.35	0.06	197.82	4.1682
IC10*	4.40	54.32	0.12	311.41	2.6654
IC15	9.27				
IC20	63.19				
IC25	133.16				
IC40	>357				
IC50	>357				

* indicates IC estimate less than the lowest concentration
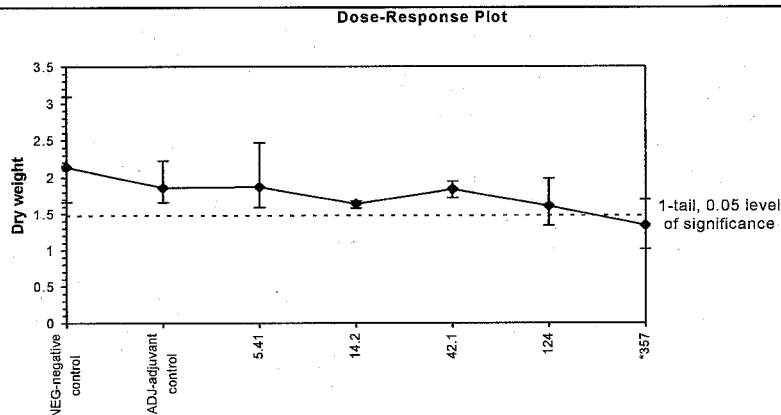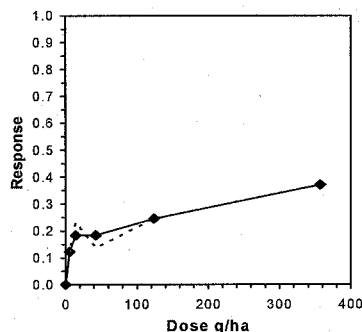
Dose-Response Plot

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

Bean

Terrestrial plants-Dry weight

Start Date:		Test ID:	1547203		Sample ID:	BAS8002-12% saflufenacil
End Date:		Lab ID:	WI-Wildlife International		Sample Type:	EP-end-use product
Sample Date:		Protocol:	OECD208-Seedling emergen	Test Species:	CRSP-crop species
Comments:						

Conc-g/ha	1	2	3	4
egative control	13.840	13.140	12.400	12.690
djuvant control	14.220	11.500	10.700	12.240
5.41	12.600	11.880	11.070	11.690
14.2	10.980	13.680	11.520	13.200
42.1	9.940	13.760	11.220	12.690
124	11.830	9.900	8.960	10.850
357	9.350	10.150	9.650	11.840

			Transform: Untransformed					1-Tailed			Isotonic	
Conc-g/ha	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
egative control	13.018	1.0701	13.018	12.400	13.840	4.818	4	*			13.018	1.0000
djuvant control	12.165	1.0000	12.165	10.700	14.220	12.392	4					
5.41	11.810	0.9708	11.810	11.070	12.600	5.335	4	1.476	2.410	1.972	12.078	0.9278
14.2	12.345	1.0148	12.345	10.980	13.680	10.517	4	0.822	2.410	1.972	12.078	0.9278
42.1	11.903	0.9784	11.903	9.940	13.760	14.048	4	1.363	2.410	1.972	11.903	0.9143
*124	10.385	0.8537	10.385	8.960	11.830	11.885	4	3.218	2.410	1.972	10.385	0.7978
*357	10.248	0.8424	10.248	9.350	11.840	10.849	4	3.386	2.410	1.972	10.248	0.7872

Auxiliary Tests					Statistic	Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)					0.97139	0.916		0.11086	-0.7552
Bartlett's Test indicates equal variances (p = 0.58)					3.77978	15.0863			
The control means are not significantly different (p = 0.34)					1.04428	2.44691			

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	42.1	124	72.2523		1.97161	0.15146	4.80279	1.33856	0.01996	5, 18
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)

Point	g/ha	SD	95% CL(Exp)		Skew
IC05*	3.75	18.28	1.62	97.98	1.8199
IC10	52.18	25.69	0.00	121.23	0.2444
IC15	87.31				
IC20	122.43				
IC25	>357				
IC40	>357				
IC50	>357				

* indicates IC estimate less than the lowest concentration
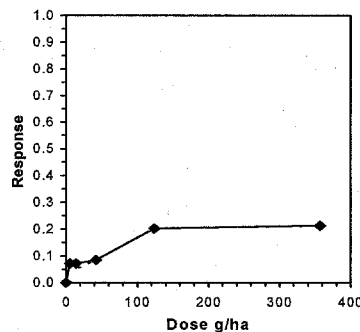
Dose-Response Plot
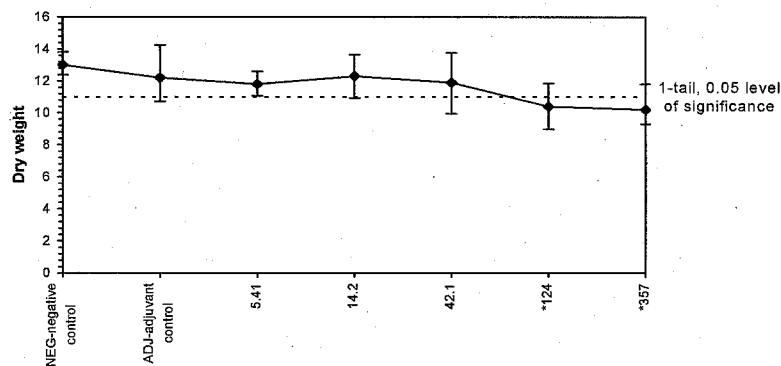
Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**
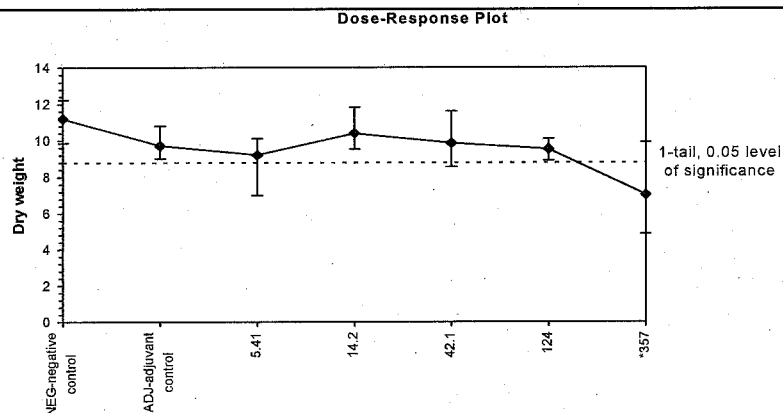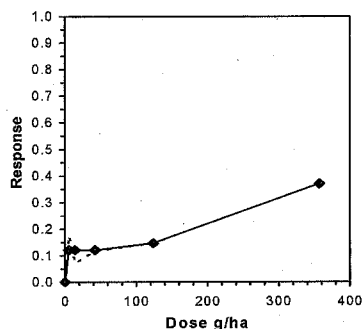
Soybean

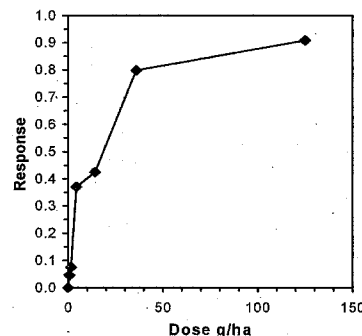| Terrestrial plants-Dry weight				
Start Date:	Test ID:	1547203	Sample ID:	BAS8002-12% saflufenacil
End Date:	Lab ID:	WI-Wildlife International	Sample Type:	EP-end-use product
Sample Date:	Protocol:	OECD208-Seedling emergen	Test Species:	CRSP-crop species
Comments:				

Conc-g/ha	1	2	3	4
egative control	12.200	9.840	10.620	12.000
djuvant control	9.360	9.000	10.800	9.700
5.41	9.840	10.100	9.900	7.000
14.2	11.800	9.600	9.500	10.600
42.1	10.160	11.600	8.560	9.100
124	10.100	9.000	10.100	8.910
357	7.490	4.860	5.880	9.900

			Transform: Untransformed					1-Tailed			Isotonic	
Conc-g/ha	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
egative control	11.165	1.1493	11.1650	9.8400	12.2000	10.108	4	*			11.165	1.0000
djuvant control	9.715	1.0000	9.7150	9.0000	10.8000	8.006	4				9.813	0.8789
5.41	9.210	0.9480	9.2100	7.0000	10.1000	16.043	4	1.983	2.410	2.3762	9.813	0.8789
14.2	10.375	1.0679	10.3750	9.5000	11.8000	10.332	4	0.801	2.410	2.3762	9.813	0.8789
42.1	9.855	1.0144	9.8550	8.5600	11.6000	13.595	4	1.329	2.410	2.3762	9.813	0.8789
124	9.528	0.9807	9.5275	8.9100	10.1000	6.949	4	1.661	2.410	2.3762	9.528	0.8533
*357	7.033	0.7239	7.0325	4.8600	9.9000	31.240	4	4.191	2.410	2.3762	7.033	0.6299

Auxiliary Tests				Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)				0.97078		0.916		0.15375	-0.0381
Bartlett's Test indicates equal variances (p = 0.55)				3.96593		15.0863			
The control means are not significantly different (p = 0.08)				2.11583		2.44691			

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	124	357	210.4		2.37622	0.21283	7.8662	1.94432	0.0123	5, 18
Treatments vs NEG-negative control										

		Linear Interpolation (200 Resamples)		
Point	g/ha	SD	95% CL(Exp)	Skew
IC05*	2.23	15.44	1.00 78.24	4.5670
IC10*	4.47	47.33	2.00 229.11	1.7209
IC15	127.48			
IC20	179.61			
IC25	231.74			
IC40	>357			
IC50	>357			

* indicates IC estimate less than the lowest concentration

Dose-Response Plot

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

Cabbage

Terrestrial plants-Dry weight						
Start Date:		Test ID:	1547203		Sample ID:	BAS8002-12% saflufenacil
End Date:		Lab ID:	WI-Wildlife International		Sample Type:	EP-end-use product
Sample Date:		Protocol:	OECD208-Seedling emergen		Test Species:	CRSP-crop species
Comments:						

Conc-g/ha	1	2	3	4
℈gative control	3.4920	3.4740	2.5830	2.9250
ɟjuvant control	3.2900	3.5100	3.5730	3.2300
0.704	3.4020	3.2100	2.9340	2.3600
1.6	2.7480	3.0800	2.9880	2.7120
4.39	1.8210	1.3120	2.9890	1.7320
14.2	1.8090	1.6720	1.9000	
35.9	1.2700	0.1400	0.4700	
125	0.1800	0.3900		

			Transform: Untransformed					1-Tailed			Isotonic	
Conc-g/ha	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
℈gative control	3.1185	0.9170	3.1185	2.5830	3.4920	14.222	4	*			3.1185	1.0000
ɟjuvant control	3.4008	1.0000	3.4008	3.2300	3.5730	4.892	4					
0.704	2.9765	0.8752	2.9765	2.3600	3.4020	15.242	4	0.438	2.490	0.8078	2.9765	0.9545
1.6	2.8820	0.8475	2.8820	2.7120	3.0800	6.249	4	0.729	2.490	0.8078	2.8820	0.9242
*4.39	1.9635	0.5774	1.9635	1.3120	2.9890	36.608	4	3.560	2.490	0.8078	1.9635	0.6296
*14.2	1.7937	0.5274	1.7937	1.6720	1.9000	6.399	3	3.781	2.490	0.8725	1.7937	0.5752
*35.9	0.6267	0.1843	0.6267	0.1400	1.2700	92.723	3	7.111	2.490	0.8725	0.6267	0.2010
*125	0.2850	0.0838	0.2850	0.1800	0.3900	52.103	2	7.131	2.490	0.9894	0.2850	0.0914

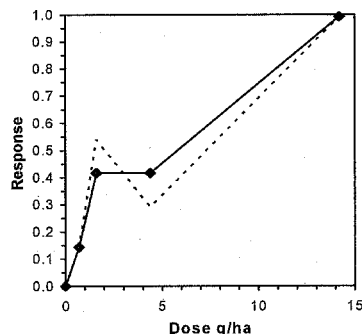| Auxiliary Tests		Statistic	Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.95985	0.916		0.56143	0.81044
Bartlett's Test indicates equal variances (p = 0.20)		8.49653	16.8119			
The control means are not significantly different (p = 0.28)		1.19174	2.44691			

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	1.6	4.39	2.65028		0.98936	0.31726	3.8443	0.2105	1.5E-06	6, 17
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)				
Point	g/ha	SD	95% CL(Exp)	Skew
IC05	0.836	0.602	0.000 2.833	0.5523
IC10	1.829	0.700	0.000 3.337	0.2868
IC15	2.303	0.766	0.000 4.533	1.3658
IC20	2.776	0.894	1.323 6.886	2.7338
IC25	3.250	1.241	1.891 9.745	2.6187
IC40	9.727	4.193	0.169 19.056	0.1086
IC50	18.559	2.283	11.785 25.175	-0.6507

Dose-Response Plot
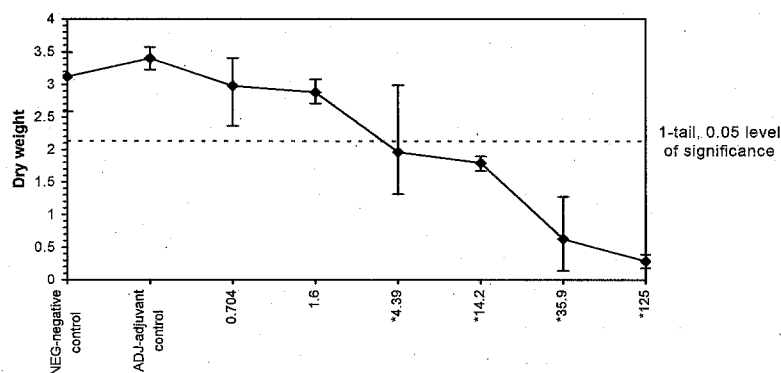
Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

Lettuce

Terrestrial plants-Dry weight				
Start Date:		Test ID: 1547203	Sample ID:	BAS8002-12% saflufenacil
End Date:		Lab ID: WI-Wildlife International	Sample Type:	EP-end-use product
Sample Date:		Protocol: OECD208-Seedling emergen	Test Species:	CRSP-crop species
Comments:				

Conc-g/ha	1	2	3	4
ɘgative control	1.1250	0.9420	0.5940	1.1830
ɟjuvant control	1.4910	0.8820	0.7260	0.8520
0.704	1.0050	0.9200	0.9360	0.4320
1.6	0.5000	0.3840		
4.39	0.4860	0.8760		
14.2	0.0070			

			Transform: Untransformed						1-Tailed			Isotonic	
Conc-g/ha	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
ɘgative control	0.9610	0.9729	0.9610	0.5940	1.1830	27.612	4.	*			0.9610	1.0000
ɟjuvant control	0.9878	1.0000	0.9878	0.7260	1.4910	34.648	4					
0.704	0.8233	0.8335	0.8233	0.4320	1.0050	31.999	4	0.778	2.420	0.4287	0.8233	0.8567
1.6	0.4420	0.4475	0.4420	0.3840	0.5000	18.558	2	2.392	2.420	0.5251	0.5615	0.5843
4.39	0.6810	0.6894	0.6810	0.4860	0.8760	40.495	2	1.290	2.420	0.5251	0.5615	0.5843
14.2	0.0070	0.0071	0.0070	0.0070	0.0070	0.000	1				0.0070	0.0073

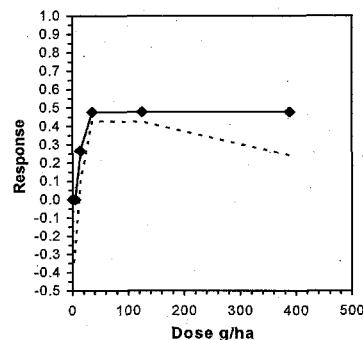| Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.86628	0.859	-0.9577	-0.3302
Bartlett's Test indicates equal variances (p = 0.78)	1.08875	11.3449		
The control means are not significantly different (p = 0.91)	0.12354	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	4.39	>4.39			0.52509	0.5464	0.12886	0.06277	0.18508	3, 8
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)				
Point	g/ha	SD	95% CL(Exp)	Skew
IC05*	0.2456	0.2968	0.0000 1.5834	0.5038
IC10*	0.4911	0.3060	0.0000 1.6883	0.1996
IC15	0.7259	0.4156	0.0000 1.8051	4.2536
IC20	0.8904	0.6990	0.0000 2.3068	4.4548
IC25	1.0549	0.9090	0.0000 9.1410	3.7307
IC40	1.5483	2.0362	0.0000 12.5475	0.6341
IC50	5.8230	1.9038	0.0000 10.4781	-0.9993

* indicates IC estimate less than the lowest concentration

Dose-Response Plot

1-tail, 0.05 level
of significance

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

Onion

Terrestrial plants-Dry weight						
Start Date:		Test ID:	1547203	Sample ID:	BAS8002-12% saflufenacil	
End Date:		Lab ID:	WI-Wildlife International	Sample Type:	EP-end-use product	
Sample Date:		Protocol:	OECD208-Seedling emergen	Test Species:	CRSP-crop species	
Comments:						

Conc-g/ha	1	2	3	4
egative control	0.0840	0.1280	0.1200	0.0900
djuvant control	0.0660	0.1280	0.1350	0.1620
1.6	0.1760	0.1530	0.1330	0.1140
4.39	0.0660	0.1760	0.1800	0.1190
14.2	0.1120	0.0980	0.0560	0.1100
35.9	0.0660	0.0500	0.0770	0.0480
125	0.0910	0.0260	0.0660	0.0600
389	0.0600	0.1140	0.0660	

			Transform: Untransformed					1-Tailed			Isotonic	
Conc-g/ha	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
egative control	0.1055	0.8595	0.1055	0.0840	0.1280	20.615	4	*			0.1283	1.0000
djuvant control	0.1228	1.0000	0.1228	0.0660	0.1620	33.054	4					
1.6	0.1440	1.1731	0.1440	0.1140	0.1760	18.487	4	-1.777	2.460	0.0533	0.1283	1.0000
4.39	0.1353	1.1018	0.1353	0.0660	0.1800	39.868	4	-1.373	2.460	0.0533	0.1283	1.0000
14.2	0.0940	0.7658	0.0940	0.0560	0.1120	27.741	4	0.531	2.460	0.0533	0.0940	0.7329
35.9	0.0603	0.4908	0.0603	0.0480	0.0770	22.853	4	2.088	2.460	0.0533	0.0670	0.5224
125	0.0608	0.4949	0.0608	0.0260	0.0910	44.075	4	2.065	2.460	0.0533	0.0670	0.5224
389	0.0800	0.6517	0.0800	0.0600	0.1140	36.997	3	1.090	2.460	0.0576	0.0670	0.5224

Auxiliary Tests		Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.97393	0.923	-0.4315	0.1952
Bartlett's Test indicates equal variances (p = 0.48)		5.4805	16.8119		
The control means are not significantly different (p = 0.48)		0.74942	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	389	>389			0.05757	0.54571	0.00442	0.00094	0.00385	6, 20
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)				
Point	g/ha	SD	95% CL(Exp)	Skew
IC05	6.227	1.867	0.000 11.498	0.1513
IC10	8.063	2.854	0.000 19.219	0.7660
IC15	9.900	3.560	0.000 23.808	0.6639
IC20	11.737	4.301	0.000 28.126	0.6136
IC25	13.573	5.019	0.000 34.549	0.5988
IC40	27.903			
IC50	>389			

Dose-Response Plot
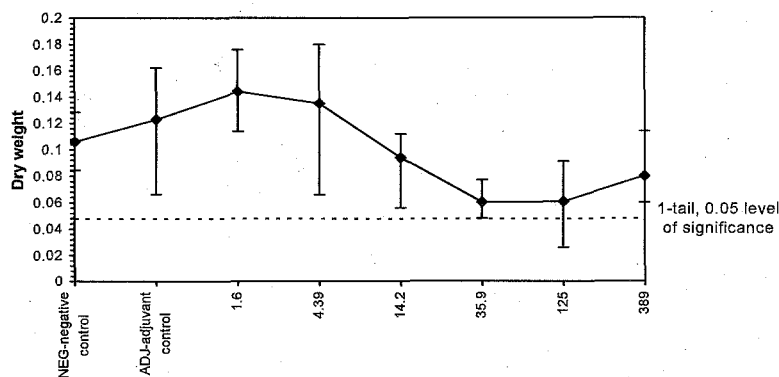
Page 87 of 89

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
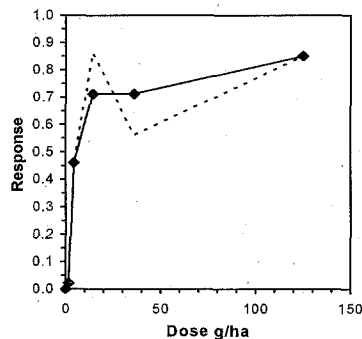**PMRA Document ID: 1547203**   **EPA MRID Number: 47127918**

Oilseed

Terrestrial plants-Dry weight

Start Date:		Test ID: 1547203	Sample ID:	BAS8002-12% saflufenacil
End Date:		Lab ID: WI-Wildlife International	Sample Type:	EP-end-use product
Sample Date:		Protocol: OECD208-Seedling emergen	Test Species:	CRSP-crop species
Comments:				

Conc-g/ha	1	2	3	4
egative control	5.3480	5.4900	4.8400	5.5600
djuvant control	5.3130	5.4990	5.4540	4.8000
1.6	6.0900	4.4280	4.6680	5.5920
4.39	4.2400	3.3400	2.1400	1.7400
14.2	0.2310	1.2300		
35.9	2.3300			
125	0.7900			

				Transform: Untransformed					1-Tailed			Isotonic	
Conc-g/ha	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
egative control	5.3095	1.0082	5.3095	4.8400	5.5600	6.125	4	*			5.3095	1.0000
djuvant control	5.2665	1.0000	5.2665	4.8000	5.4990	6.094	4					
1.6	5.1945	0.9863	5.1945	4.4280	6.0900	15.014	4	0.201	2.340	1.3390	5.1945	0.9783
*4.39	2.8650	0.5440	2.8650	1.7400	4.2400	39.835	4	4.272	2.340	1.3390	2.8650	0.5396
*14.2	0.7305	0.1387	0.7305	0.2310	1.2300	96.701	2	6.534	2.340	1.6399	1.5303	0.2882
35.9	2.3300	0.4424	2.3300	2.3300	2.3300	0.000	1				1.5303	0.2882
125	0.7900	0.1500	0.7900	0.7900	0.7900	0.000	1				0.7900	0.1488

Auxiliary Tests			Statistic	Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)			0.96429	0.874		0.2522	-0.5749
Bartlett's Test indicates equal variances (p = 0.36)			3.22052	11.3449			
The control means are not significantly different (p = 0.86)			0.18823	2.44691			

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	1.6	4.39	2.65028		1.63989	0.30886	13.006	0.65484	1.6E-04	3, 10
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)

Point	g/ha	SD	95% CL(Exp)		Skew
IC05	1.7802	0.4887	0.0000	2.2738	-0.6666
IC10	2.0982	0.3316	0.2324	2.7962	-0.8203
IC15	2.4161	0.2985	0.9838	3.3185	-0.2965
IC20	2.7341	0.3183	1.2887	3.8408	0.0473
IC25	3.0520	0.3695	1.5554	4.5654	0.3658
IC40	4.0059	0.9475	2.3957	9.6555	1.5127
IC50	5.9353	1.8429	1.3367	12.8183	0.5013

Dose-Response Plot
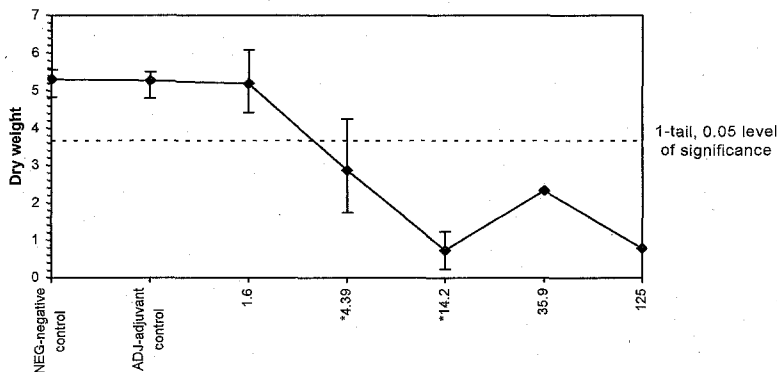
1-tail, 0.05 level of significance

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number: 2008-0431
PMRA Document ID: 1547203   **EPA MRID Number: 47127918**

Tomato

Terrestrial plants-Dry weight

Start Date:		Test ID:	1547203	Sample ID:	BAS8002-12% saflufenacil
End Date:		Lab ID:	WI-Wildlife International	Sample Type:	EP-end-use product
Sample Date:		Protocol:	OECD208-Seedling emergen	Test Species:	CRSP-crop species
Comments:					

Conc-g/ha	1	2	3	4
egative control	1.6240	2.0930	1.7050	1.7640
djuvant control	1.4200	1.2480	1.4560	1.5300
1.6	0.8970	2.1060	0.7550	2.2080
4.39	1.1240	0.7320	0.2560	0.7350
14.2	0.2100	0.1290	0.7940	

				Transform: Untransformed				1-Tailed			Isotonic	
Conc-g/ha	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
egative control	1.7965	1.2710	1.7965	1.6240	2.0930	11.457	4	*			1.7965	1.0000
djuvant control	1.4135	1.0000	1.4135	1.2480	1.5300	8.451	4		2.310		1.4915	0.8302
1.6	1.4915	1.0552	1.4915	0.7550	2.2080	51.744	4	0.895	2.310	0.7873	1.4915	0.8302
*4.39	0.7118	0.5035	0.7118	0.2560	1.1240	49.912	4	3.183	2.310	0.7873	0.7118	0.3962
*14.2	0.3777	0.2672	0.3777	0.1290	0.7940	96.070	3	3.854	2.310	0.8504	0.3777	0.2102

Auxiliary Tests						Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)						0.97032		0.881		0.04003	-0.6677
Bartlett's Test indicates equal variances (p = 0.21)						4.53843		11.3449			
The control means are significantly different (p = 0.02)						3.21871		2.44691			
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df	
Dunnett's Test	1.6	4.39	2.65028		0.85043	0.47338	1.56505	0.23235	0.00763	3, 11	

Treatments vs NEG-negative control

Linear Interpolation (200 Resamples)

Point	g/ha	SD	95% CL(Exp)	Skew
IC05*	0.4712	0.6819	0.0000	2.7331	0.6902
IC10*	0.9424	0.6806	0.0000	2.9061	0.3547
IC15*	1.4136	0.6903	0.0000	3.0792	0.0844
IC20	1.7943	0.7049	0.0000	3.3066	-0.0601
IC25	2.1157	0.7256	0.0000	3.6019	-0.1644
IC40	3.0799	0.7556	0.0077	4.4736	-0.5364
IC50	3.7227	1.0556	0.0860	8.3758	1.0796

* Indicates IC estimate less than the lowest concentration

Dose-Response Plot